How to manage unintended consequences. Leadership Series, following page 32



Bookstore aisles? The cinema? No place is off-limits for desperate recruiters like Amy Naples. Page 67

News updates, features, forums: www.computerworld.com January 20, 1997 · Vol. 31 · No. 3 · 126 pages · \$3/Copy \$48/Year

IBM moves AS/400 to high end

► CISC-based IS shops face upgrade decision

By Tim Ouellette

IBM THIS YEAR will stretch its AS/400 midrange system to the high end with plans for new multiprocessor systems and an upgraded operating system.

Sources close to the company said it will roll out RISC-based systems, tentatively dubbed the

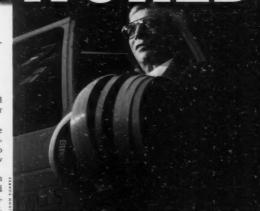


happy with current RISC models

600 series, that offer eight- and 12-way multiprocessing for high-end customers.

And a new version of the OS/400 operating system, Version 4 Release I, also will ship to handle heavy lifting for the new hardware.

They are going to break open the top end of their line," said Tom Bittman, an analyst at Gartner Group, Inc. in Stamford, IBM, page 16



his own hands when he rescued data tages during last year's fire

U.S. firms go offshore for cheap year 2000 fix

By Jaikumar Vijayan

PLENTY OF CHEAP foreign labor is driving more U.S. firms to hire overseas programming companies to do their year

2000 conversion work.

range field goal that

Exact figures aren't available, but experts who track the field said the number of firms hiring foreign programming shops to do year 2000 work could swell

significantly during the next year as the countdown to 2000 begins in earnest.

One company that has committed to offshore outsourcing is Consolidated Edison Company of New York. It already has contracted - and successfully completed - two pilot projects with fixed-cost contract firms in India and Ireland, Con Edison now is on the verge of contracting all its 105 date-sensitive pro-Year 2000 fix, page 17

McAfee to push antivirus updates through the Web

By Mitch Wagner

For sports apparel firms Sports, page 105

By Bob Wallace What's more

crucial — a last-minute long-

ices a Super Bowl victory? Or having the computer systems to provide rabid fans nationwide with official merchandise after the ball sails through the uprights?

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MCAFEE ASSOCIATES, INC. today plans to announce a deal to distribute updates of its antivirus software automatically over the Internet, without human intervention.

The deal with BackWeb Technologies, Inc. was designed to be a huge labor-saver for information systems departments. IS staffs will avoid having to retrieve and install antivirus updates, which will be available on an hourly basis from McAfee.

The distribution method McAfee, page 12

Mill disaster fires up planned IS overhaul

By Matt Hamblen LAWRENCE, MASS.

THE FIRE THAT engulfed the Malden Mills complex here in December 1995 — causing more than \$300 million in damage - could have shut down the Polartec fabric maker for good. Instead, it invigorated the mill's workers and accelerated a previously planned \$10 million to \$15 million information and automation systems overhaul.

The day after the fire. Aaron

Feuerstein, president and coowner of Malden Mills Industries, Inc., wowed observers by pledging to rebuild locally and promising to pay idled workers. His bold directive inspired his top managers, who immediately made the massive system redesign their top priority.

In an unusual move, a top business executive - not an IS manager - was put in charge of the system redesign. Michael Backler, corporate director of

IS overhaul, page 28

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domore

now/

It's like a dream you might have had: one **beautiful fluid motion** management dances/users share and collaborate and work together/you (not needing to answer questions)



on through the company/
work less/
read.

Now/ Microsoft* Office 97 is here. It's smarter, friendlier and webbier. Every application has significant improvements—natural-language formulas in Microsoft Excel and "freehand" table drawing in Word, to name a few. There's also a new program, the Outlook* desktop information manager, that will thrill your control freaks and just plain organize everyone else. The friendlier part comes in the form of Office Assistants, intelligent critters who watch what your users do and offer suggestions, hints and walk-throughs (so you're less likely to be called, paged, or treed by a cranky mob). As for webbiness, not only can your people instantly link to Web sites from inside any app, they can insert hyperlinks from any one document or spreadsheet to any other. And they can save anything in HTML. All using what they already know. (Hello, intranet!) You'll be happy to know that 50% of Office 97 code is shared among apps. Plus, more housework is done at install. And the Network Installation Wizard is your friend. Now/ pinch yourself.

Microsoft^{*}

Better, not bigger

icrosoft arguably has the best software-testing organization in the world. Yet even Microsoft couldn't prevent a bug fix for Windows NT 4.0 from being reeased that was so buggy it crashed hundreds of users' servers [CW, jan. 13].

This situation isn't unique. If you want to see an IS manager's face flush, ask about the state of software quality. The software industry continues to push bloated, buggy products packed with features that only a few people will use. Yet IS must dutifully go along with the endless upgrade cycle or risk losing consistency across an organization.

Software is getting worse because it's becoming impossible to test the stuff.

Microsoft's new Office 97 is a 121 M-byte monster. There's no way to find all the possible flaws in a product that big. And most users will run Office simultaneously with a fistful of other applications, utilities and Internet-sniffing background agents

Software is getting worse because it's becoming impossible to test the stuff

from vendors of all stripes. Is it any wonder some of the best-selling software in the past two years has been utilities that intercept and manage software errors?

At the same time, the pressure to get products to market is pushing vendors to test software in the field. New products are no longer shroud-

ed in secrecy; early versions are posted on Web sites for users to download and test. Endless patches and bug fixes follow. No two desktops are the same anymore.

It's chaos out there, and the mess invariably gets dropped in the lap of an ill-prepared and understaffed IS department.

The frustration building in IS organizations may erupt in widespread disinterest. Only about a quarter of Office users upgraded to Office 95. What if only a quarter of them took the leap to Office 97? Maybe that would send the industry a message: Bigger software isn't necessarily better. Focus on helping us manage what we've already got.

FIFTH

Paul Gillin, Editor Internet: paul_gillin@cw.com IS brings good things to GE

▶ Quality program, several technology projects key to company's resurgence

By Thomas Hoffman

WHEN GENERAL ELECTRIC Co. last week reported that it earned \$7.28 billion last year, the news did more than illustrate the success of GE's yearold quality improvement push.

It demonstrated just how valuable the company's information management group has been to GE's renaissance.

A commitment to quality and customer focus has been the linchpin of GE's success, but several key technology projects have also helped. One of those projects is GE's Trading Process Network, an Internet-based electronic commerce system that is expected to generate \$1 billion in contract opportunities for global suppliers this year.

And GE's retail customers now can harness a GE Capital Corp. data warehouse that contains information on 12 million private-label and commercial credit-card customers.

That should help companies such as Casual Corner Group, Inc. It can identify its most profitable customers and target promotions designed to lure those customers to its stores, said Karen Tyson, director of strategic marketing at the 1.000-store chain in Enfield, Conn.

GE in the past year has invested \$200 million in quality training and systems that measure the program's effectiveness by capturing metrics, including frequency and type of manufacturing defects.

Most of Fairfield, Conn.-based

GE's 12 business units broke even on their investments. This year, GE expects additional \$300 million quality investment to generate \$400 million to \$500 million in savings.

"Last year was the learning curve; this year we expect much bigger results," said Eliza-

beth Gallucci, leader of best practices at GE Capital in Dacula, Ga.

GE's Six Sigma quality program isn't unique - the company borrowed it from Motorola, Inc. But experts said GE's ability to successfully use information technology to measure its quality control progress and to tighten its ties with customers has been unparalleled.

"There tend to be hit-ormiss approaches to what constitutes good quality," said Stephen A. Bender, executive director at The Quality Connection, a management consultancy in Englewood, Colo. "That's

the key difference between those who use IT effectively and those who don't."

Chairman John F. Welch's commitment to the quality program standing of IT's role in it have helped separate GE from the rest of the pack, said Richard A. Henderson, a fi-

nancial analyst at the Pershing, N.J., division of Donaldson, Lufkin & Jenrette Securities Corp.

Welch's choice of Gary M. Reiner, GE's chief information officer, to orchestrate the program demonstrated the key role IT would play.



Heads GE's quality improvement efforts

Subscriber drive backfires on

By Mitch Wagner and Patrick Thibodeau

FACED WITH multiple classaction lawsuits from upset customers, America Online, Inc. last week detailed steps it will take to ease congestion on its network.

Ever since the company began offering unlimited access for \$19.95 per month, custoiners have been complaining that they have been unable to access the service. An independent study found the service was inaccessible more than three quarters of the time during peak usage periods soon after the company started the unlimiteduse pricing plan.

Calls to 24 AOL access points failed to connect 76% of the time during the period of 10 p.m. to 10:59 p.m., according to research conducted Dec. 23 to Jan. 2 by Inverse Network Technology, Inc. The figures showed AOL performance was nearly six times worse than the national average for Internet service providers.

"AOL has become absolutely dismal," said user Jean Achille. managing partner at The Devon Group, a management consultancy in Holmdel, N.J. "And as a small business, we just can't dial in anymore. It's particularly bad right after school, when the kids come home from school and they log in to the chat rooms right away."

America Online last week outlined several steps intended to ease network congestion from spending more money on modems to scaling back efforts to attract members. Interestingly, America Online's move to curtail membership drives was announced on the same day it said membership had surpassed 8 million users

The system improvement plan includes the following:

- Increasing investment in system capacity from the previously announced \$250 million to \$350 million.
- ■Increasing modem capacity by 75%. The company currently has 200,000 modems.
- The company will hire an additional 600 customer support representatives over the next six months, bringing the total to 4.500.

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- *TACKLING THE YEAR 2000 PROBLEM Check out our new year 2000 page, where you'll find the most recent articles and features on the year 2000 date problem. (www.computerworld. com/year2000)
- *PAIN RELIEF Telecommuters take heart. Computer industry writer Rochelle Garner shares firsthand insight on how to select ergonomically friendly equipment. (www.computerworld.



Rich Tennant at the swave @tiac.net

Domain name deadbeats owe \$21M to Internet fund

By Gary H. Anthe:

A FUND SET UP 16 months ago for "the preservation and enhancement of the intellectual infrastructure of the Internet" is millions of dollars short because users have failed to pay fees for domain name registration.

The National Science Foundation (NSF) last week confirmed a report in *The Washington Post* that the fund was about \$21 million in arrears.

Humber of Internet hosts each year during January		
1995	4.9M	
1996	9.3M*	
1997	17.8M*	
1998	34M*	
1999	65M*	
*Projected		

Source: Internet Society, Herndon, Va

And the NSF, which established the fund, has no idea what to do with the nearly \$10 million it has.

Don Mitchell, a staff associate at the NSF, said some of the shortfall represents recent registrations by organizations that routinely stretch out payments 30 to 90 days.

"When we set this up, we didn't want to impede the growth of the Internet," Mitchell said. "So we continue to register first and pay later."

The funds are collected by Network Solutions, Inc. in Herndon, Va. The company runs the InterNIC Registry for North America and collects \$100 for the registration of each Internet address of the type acme.com. Network Solutions pays 30% of the fees collected into the Internet improvement fund.

InterNIC is registering about 80,000 new domain names a month and, through November, \$9.9 million has gone into the fund, according to the InterNIC World Wide Web site (rs. internic.net). But the funds that have been collected remain unused, because no one can agree on how to spend them.

Under terms of its agreement with the NSF, Network Solutions will devise a mechanism for spending the funds. But it has run into opposition over its role, Mitchell said. He said he expects the company to propose such a mechanism soon.

Support delays irk Oracle users

▶ No support yet for vendor's client/server applications with Oracle7.3 database

By Craig Stedman and Randy Weston

ORACLE CORP. users are starting to chafe at the time it is taking the company to certify its client/server applications for use with the latest release of its database.

Oracle7.3 became available last February, but users who run their business on Oracle applications can't deploy the database because Oracle still hasn't given the thumbs-up sign to use the two products together. Meanwhile, rivals such as SAP AG and PeopleSoft, Inc. started clearing their applications for use with Oracle7.3 last year.

The database and applications have to be certified together before Oracle will support them.

But the long certification process on Oracle7.3 is forcing users to bide their time before they upgrade the database, which offers features such as Windows-based management.

PERFORMANCE BOOST

The Windows capability is a "huge" improvement over the character-based interface on earlier databases, and it could reduce the need to buy third-party administration tools, said Hugh

Vendor Application Certification date
Oracle Oracle Q1 1997
Applications 10

SAP R/3 3.0f Limited support now

PeopleSoft PeopleSoft 5 PeopleSoft 6 November 1996

Baan Baan IVb Q1 1997

STAMP OF APPROVAL

Allan, manager of information technology at Dunlop Tire Co. in Amherst, N.Y. But Dunlop doesn't expect to upgrade most of its servers to Oracle7.3 until next summer, he said.

Oracle's upgrade process "is wery restrictive, and that really impacts on us," Allan said. The close ties between Oracle's database and applications boost performance and cut Dunlop's tuning workload, "but there is a trade-off," he said.

In comparison, Allen said, Dunlop can usually just go to a new database at will with the Lawson Software, Inc. applications it also uses.

Cliff Godwin, vice president of applications technology at Oracle, acknowledged that the approval process for Oracle Applications 10 for use with Oracle7.3 has been "one of our longer certifications."

Godwin said the combination will be cleared for Sun Microsystems, Inc.'s Solaris operating system this week or next. Other Unix platforms should be cleared by March. "We could be more aggressive, but we don't want to just assume that upward compatibility is there," he said.

Oracle's conservative approach may help protect its customers from charging forward with applications that blow up on them. "But it is definitely a blockade to the users," said David McGoveran, president of Alternative Technologies, a consultancy in Boulder Creek, Calif.

Ron Hawkins, director of IT at Millipore Corp. in Bedford, Mass., is looking ahead to the Oracle8 database due to be released by midyear. But Hawkins said he doesn't expect to upgrade Millipore's 30 databases to Oracle7.3 until May.

More work, less golf helps Unisys IS cut costs

By Thomas Hoffman

WHEN JOHN CARROW was the city of Philadelphia's chief information officer last year, he fell seven rounds short of his goal of playing 25 rounds of golf.

As the new CIO at Unisys Corp., he'll probably spend even less time on the links. "I set the same goal this year, but I don't know if I'll be able to meet that," Carrow said.

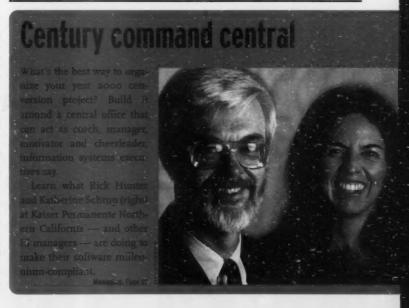
IS PROJECTS

Unisys in Blue Bell, Pa., constantly seeks ways to cut costs. A current project was designed to consolidate its six global electronic-mail systems into two systems: Microsoft Corp.'s Exchange and Lotus Notes.

But the company still struggles to find revenue opportunities. "From an IT function, we don't necessarily generate revenues, but we can provide enablers so that the businesses can," said Carrow, who will oversee a 1,200-person information systems staff.

One of those enablers is an IS project to establish more electronic data interchange connections with key customers. That is expected to streamline the way Unisys customers gather information about equipment and services. Unisys also has rolled out an Oracle Corp.-based financial system to 130 of its 160 offices worldwide. By standardizing on a common reporting system, Unisys hopes to make its financial operations more efficient, Carrow said.

Unisys "is making progress, but it's torturously slow," said Michael J. Geran, an analyst at the Pershing Division of Donaldson, Lufkin & Jenrette Securities Corp. in Jersey City, N.J.



In this issue

Management switcherou

NCR abandons Hewlett-Packard, recom mends CA-Unicenter TNG to manage NCR hardware

Suite deal

Corel licenses still-unproven Netscape suite to compete with Office 97.

Development tools that add depth to Web sites will debut at Lotusphere.

Financial stability?

In a turnaround effort, Apple touts \$1.8 billion in cash, but it owes \$1 billion, too.

Merger madness

Internetworking merger frenzy leaves users without knowledgeable sales reps.

Object objections

Finding and maintaining reusable code isn't cost-effective, Martin A. Goetz

33 Chaotically mobile

As they evolve, handheld devices will swamp IS like tribbles on the starship Enterprise, John Gantz predicts.

TECHNICAL SECTIONS

SERVERS & PCs

Wanted: open storage

Users seek storage systems to handle data from different brands of servers

NUMA scales Pyramid

Pyramid unveils a scalable server that uses Non-Uniform Memory Access (NUMA) technology,

SOFTWARE

Go directly to Java

Direct database links make Java useful to businesses.

The strategy to support two operating systems turns off longtime users.

THE ENTERPRISE NETWORK

Pull your disk together

The old problem of disk fragmentation



unexpectedly hits Windows NT users.

Not when it's switch price wars. IS wins as Ethernet port costs tumble.

THE INTERNET

Setting rules

Intranet managers establish standards to head off chaos among internal Web sites.

Ready for action

Toys no more — HTML editors become serious tools for electronic commerce.

CORPORATE STRATEGIES

Medicald strategy

Maine implements decision-support system to track cases, cut waste.

Instead of seeking new workers, The Tribune Co. teaches staff Internet skills.

FEATURES

Year 2000 scoreboard

There are only 1,076 days left before 1/1/00. Are you ready?

As the pendulum swings

Innovation or discipline? IS' business managers are often displeased either way, columnist Peter G. W. Keen writes.

BUYER'S GUIDE

Product reviews

Windows 95 upgrade and Norton Utilities for Windows 95.

MARKETPLACE

Putting the 'P' in PiM

Personal information managers (PIM) get highly personal.

Company index	
Editorial/Letters	
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How to contact CW/Subscriptions	-
Inside Lines	
Stock Ticker	



Software pivotal to big iron renaissance

By Tim Ouellette

COME SEE the softer side of big iron.

Because mainframe hardware sales have rebounded in the past two years, users seek better software to leverage their mainframe investment and turn the machines into enterprise servers, not just heavy-lifting number crunchers. In fact, most observers see business software as the key to whether the hardware-based mainframe revival can be sustained.

The good news for main-

make the hardware practically a commodity, with cheaper and easier-to-maintain air-cooled systems and parallel sysplex, a clustering architecture.

CUSTOMER DEMAND

Although the improvements give mainframes the muscle to test all the new code for year 2000 conversions and run existing applications, the future looks less rosy unless more applications hit the streets.

"Customers are putting far more emphasis on what software packages will run on the



frame shops is that more software vendors plan to port their PC or Unix applications to OS/390 - IBM's latest and greatest mainframe operating system - in the coming year

APPLICATIONS ON THE WAY

Heading the list are SAP AG's R/3 database server, due by midyear; Baan Co.'s Baan 4.0, due in the first half of the year; and I. D. Edwards & Co.'s OneWorld suite and Lotus Notes, both due in the second half of the year.

"With better applications, I think the mainframe will become a central server." said Douglas Mackie, vice president of megacenter operations at Zurich Insurance Group, Inc. in Schaumberg, Ill. "This will help mainframe use run well into the next century."

Recent research by Infoplex Corp. in Hayward, Calif., found that 11% of total mainframe processing power in data centers is being used for online serving in client/server applications rather than in the mainframe's batch processing mode.

Mainframe vendors such as IBM, Amdahl Corp. and Hitachi Data Systems Corp. have worked the past few years to mainframe," said John Young, an analyst at the The Clipper Group, Inc. in Wellesley, Mass.

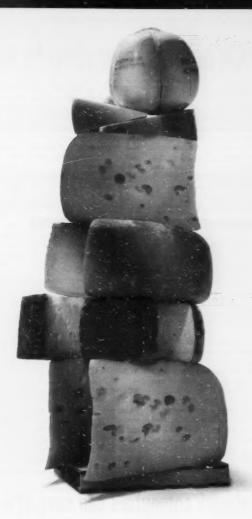
Because the mainframe already hosts so much of corporate America's data, bringing the applications home is seen as a way to simplify overall management. "A lot of data we work with is on the S/390 already. So running applications where the data already is makes sense," said John Bevis, president of Share, an IBM mainframe user group based in Chicago.

But not everyone is pushing code back to the mainframe. The trend has been to offload application development to Unix and Windows NT plat-

"All new development for us is in client/server, though our bread-and-butter billing applications still remain on the mainframe," said Phil Orton, director of central operations at Entergy Corp. in New Orleans.

And although there has been lot of movement among developers to the S/390 platform, it is nowhere near that of Windows NT, which will be the mainframe's greatest competitor, said Ed Carr, an analyst at Aberdeen Group, Inc. in Boston.





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NCR pushes migration to Unicenter

THERE ARE SOME unexpected migrations ahead for users of NCR Corp.'s systems and network management platforms.

In a surprise announcement last week, NCR urged users to switch from Hewlett-Packard Co.'s OpenView to Computer Associates International, Inc.'s CA-Unicenter: The Next Generation (TNG).

OpenView management platform for NCR hardware, company officials said.

Previously, NCR relied on OpenView, a smattering of other management products and its own Operations Advantage package to help customers manage their systems.

NCR said it will work with CA to migrate users of these platforms to CA-Unicenter TNG. But the company will continue Brisbane, Calif.

CA-Unicenter now manages the company's mainframe and seven minicomputers. With this announcement, Good Guys will migrate its 80 NCR servers to the same management platform. Dodd said.

CA-Unicenter's support for Windows NT also ties in closely with NCR's Windows NT-centric strategy, analysts said.

"The reason this announcement was made is that Open-View seems to have been slow to get over to the NT platform," said Brandon Musler, an analyst at Illuminata, Inc. in Nashua,

HP's enterprise edition of OpenView for Windows NT was due last fall but may not be ready until next quarter.

"To that extent, this alliance is going to be useful for NCR users following NT," said Brian Murphy, an analyst at The Yankee Group in Boston

As part of the deal, CA will acquire and integrate selected Operations Advantage products and technologies from NCR. Future versions of CA-Unicenter 1.5 and CA-Unicenter TNG will include support for NCR's Life-Keeper clustering software, TopEnd middleware and Tera-Data database.

TRADING PLACES Pentium 1.07M 800,000 294,000 Pentium Pro 72.000 736,000

Compaq goes Pentium Pro

By April Jacobs

COMPAO COMPUTER CORP. is betting big on Intel Corp.'s Pentium Pro, and the rest of the server pack may not be far be-

The industry's top PC maker last week revealed it will expand its ProLiant and ProSignia Pentium Pro-based servers at the expense of a line of Pentiumbased machines introduced a little more than a year ago.

The Houston-based company said its Pentium Pro-based servers will give users more room to grow. They will come bundled with more management software, making them cheaper to maintain and faster.

"We would expect that on the server side, most vendors will phase out the Pentium by the end of 1997," said Susan Frankle, an analyst at International Data Corp. in Framingham, Mass.

She said phasing out Pentium-based machines for servers makes sense and predicted that the timing of the shift will depend on how quickly Intel moves to reduce Pentium Pro pricing, which will narrow the price gap between Pentium and Pentium Pro machines.

SOUND STRATEGY

Users also said the strategy is sound, and many have already moved to Pentium Pro-based

Frank Delargy, information systems manager at Waltham, Mass.-based Polaroid Corp., said he wouldn't consider buying Pentium-based machines, because they aren't suited for the Windows NT environment. He recently purchased Pentium Pro

"NT Server 4.0 was written for Pentium Pro and works well as an infrastructure for our NT environment," Delargy said.

Users can upgrade their Pentium-based Compaq servers, such as its ProLiant 1500, by swapping in new boards, the company said.

Still, there is a price differential to consider. Machines with Pentium Pro chips cost about 20% more than their older siblings, Frankle said.

Dell Computer Corp. in Round Rock, Texas, is also leaning toward Pentium Pro machines. The company last year introduced the PowerEdge 2100, a uniprocessor Pentium Pro server, and the PowerEdge 4100, a dual-Pentium Pro server. Those models replaced the Pentium-based PowerEdge XE, SP and EL models.

Dell is also gearing up to announce the PowerEdge 6100, a quadprocessor server, at the end of the month.

Hewlett-Packard Co. said it is also migrating to the Pentium Pro, but only on its higher-end server lines. Low-end servers will still run on the Pentium chip for now.

BUNDLED SOFTWARE

Compaq's new ProLiant 800 will feature 180-MHz or 200-MHz Pentium Pro processors and beefed-up server management software. It will serve as an upgrade to the company's ProSignia 300.

Compaq is bundling its Integration Server software, which allows network managers to configure a single server and replicate that configuration across multiple servers, with the ProLiant 800. Also standard are Insight Manager management software and SmartStart, which helps with server configuration

Pricing and availability will be announced this week.

Correction

Due to a reporting error in the Dec. 23/Jan. 2 issue of Computerworld (page 8), Barry Adam, the director of information services at The Disney Store in Glendale, Calif., was misquoted. The story should have stated that Disney merchandise received at the store's distribution center is "cross-docked" from the receiving docks to the outbound shipping docks.

NCR BACKS CA-UNICENTER

What's the deal: NCR will sell CA-Unicenter software for all its platforms. It will no longer sell HP OpenView

What it means: Those using OpenView and NCR's management software will be migrated to CA-Unicenter.

What's in the future: CA will integrate support for NCR's LifeKeeper clustering software, Topend middleware and NCR's TeraData database in CA-Unicenter.

This could result in some painful and complicated migrations for customers, analysts said. But analysts also believe that the actual number of such NCR users is fairly small.

NCR in Dayton, Ohio, has entered into an agreement with CA under which NCR will sell CA-Unicenter TNG as the management platform of choice for all NCR hardware. NCR will no longer sell or recommend HP's

GARTNER GROUP REPORT

chase, users can expect to save

26% to 41% vs. the cost of a typi-

cal networked, Windows 95-

based workstation environment.

This and other findings will

be detailed this week when Gart-

ner Group, Inc. releases its

study, "Network Computers:

some organization to the discus-

sion of network computers. It

separates available products from future products, breaks

the hardware into classes and

compares the cost savings possi-

The report attempts to bring

Total Cost of Ownership.

to continue with their existing management NCR officials said

for us to migrate all our stuff over to Unicenter. But in the end, I think it is going to be worth it," said Roy Dodd, director of information systems at The Good Guys, a consumer

WORTHWHILE MOVE "It is going to be a little painful

Network computers can save 41% over PCs level. The total cost-of-ownership savings over a five-year life DEPENDING ON the class of cycle is estimated at 33% savnetwork computer they pur-

■NC-C. These are client-centric network computers that execute applications at the desktop. Companies that purchase the NC-C models should save approximately 41% over today's standard networked PC model.

■ NetPC. This is a planned, diskless Windows box with only a handful of hardware specifications to its name. For those willing to wait for the NetPC, the study predicts that the cost-ofownership savings will come to about only 26%.

Some NC-S models are available now. Examples include HDS Network Systems, Inc.'s @workStation, Wyse Technology. Inc.'s Winterm series and Network Computer Devices, Inc.'s Explora. If a company is going to roll out a network computer to its workforce this year, it will be an NC-S.

NC-C models include the Java-based models such as IBM's Network Station, Sun Microsystems, Inc.'s JavaStation and others such as models from Acorn Computer Group Ltd. that license software from Oracle Corp.'s Network Computing subsidiary. The study predicts these machines will become a factor in the NC marketplace in

The NetPC will be based on hardware specifications put-forward by Microsoft Corp. and Intel Corp. Although NetPC hardware platforms may become available this year, the crux of the NetPC - the software won't be available until at least the middle of next year.

Some industry analysts said they see this specification as a way for Microsoft and Intel to stall migration or purchases of network computers by spreading fear and uncertainty throughout an uneducated mar-

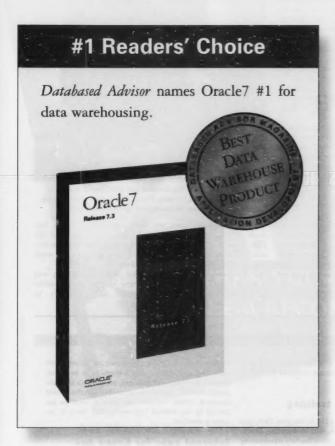
ble from each class. TRIO OF CLASSES

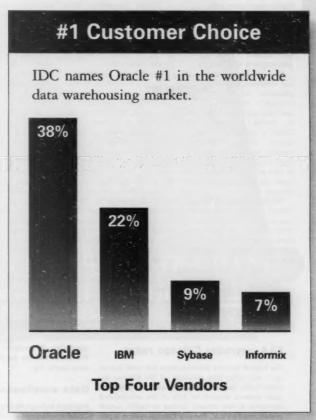
By Stewart Deck

The following three classes of network computers are in the

• NC-S. These are server-centric network computers that execute application code at the server

Oracle7 #1 For Data Warehousing





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GMAC takes Fast Ethernet route to multimedia intranet

By Justin Hibbard

NIRAI PATEL knows an opportunity when he sees one.

The chief technology officer at GMAC Commercial Mortgage Corp. saw the stars align last year when the growing company decided to move to a bigger campus in Horsham, Pa.

Patel had long wanted to roll out multimedia ap-NETWORKING

plications on the company's intranet

and open parts of the network outside customers. GMAC's aging 16M bit/sec. shared Token Ring LAN couldn't support the load. So when management committed to relocating. Patel issued a request for proposals for a new network

"We looked at [Asynchronous Transfer Model to the desktop and 100Base-T shared switched,' Patel said. "It basically came down to saying, 'What's the best price/performance we're look-

The answer was a 100M bit/sec. Fast Ethernet backbone connected to 25 Fast Ethernet 100M bit/sec. service to users' desktops

GMAC Commercial Mortgage and sister company GMAC Mortgage Corp. leased the entire package from 3Com Corp. in a \$1.3 million deal that gives GMAC the option to buy it for \$1 after three years.

The increased bandwidth allowed Patel to begin

building an extranet a portion of the company's intranet that outside customers can access - without worrying about congestion from the added traffic.

Dubbed Investor Query, the service will let investors log in to GMAC's intranet through a World Wide Web page.

"This will allow all our investors to go through the Internet and get loan-level detail on all the loans we service for them as well as occupancy rates, inspections and pictures of the properties," Patel said.

Investors will be able to request a property inspection by filling out an electronic form, which will be routed to GMAC's

inspection, the contractors will be able to log in to GMAC's intranet to report their findings in a form and upload digital photos. Investors will have access to the inspection results as soon as they are posted.

"Right now, using the paper system takes a week to file an inspection to investors. We're hoping this new process will take two days or less,"

"It would be enormously helpful to investors," said Deborah Seife, director at Fitch Investors Service LP, a mortgage securities credit rating firm in New York. "What underlies these transactions are these properties. The ability to have some feel for the quality of the properties is important.'

Outside customers aren't the only ones who will benefit from GMAC's extra bandwidth. Employees will gain access to videotaped training and television broadcasts transmitted across the network by Starlight Networks, Inc.'s StarWorks media server.



"We looked at ATM to the desktop and 100Base-T shared switched," says GMAC's Niraj Patel. "It came down to saying, 'what's the best price/performance we're looking for?"

could never get people to take time off to get trained," Patel said. "Now we can say, 'When you have time, take five minutes here, five there.

Harry Fenik, an analyst at Zona Research, Inc. in Redwood City, Calif., said few companies

'With our growth rates, we have upgraded to 100M bit/ sec. networks because of the high cost of installing new network interface cards on every

But GMAC's situation was unique in that the relocation provided an opportunity to upgrade.

FAA upgrades Chicago radar

The Federal Aviation Administration last week turned on a new radar data processor at the Chicago Air Route Traffic Control Center. Outmoded computers for radar systems account for 87% of the unscheduled downtime at the nation's busiest air traffic control centers, the FAA said. The new Chicago system, a pair of IBM ES 9221 Model 170s, replaces an early-1970s IBM computer that was down 333 hours last year. Similar upgrades are scheduled this year at airports that serve New York, Cleveland, Washington and Fort

Compag gets into leasing

PC maker Compaq Computer Corp., trying to be more like the big systems vendors, plans to get into the computer leasing and financing business later this year. Compaq named Irving Rothman president of the venture, called Compaq Capital Corp. Rothman came from AT&T Capital and AT&T Credit Corp.

Apache posts security fixes

The Apache HTTP Server Project last week posted to its World Wide Web site patches for two security holes recently discovered in its Apache 1.1.1 Web server. One of the holes could allow intruders to gain access to files on servers. The other hole could let unauthorized users view the contents of a Web server directory. The server and the patches are available for free at www.apache.org.

Data warehouse training

Migration Software Systems Ltd. in San Jose, Calif., and Global Knowledge Network, Inc. in Waltham, Mass., are tearning up to fill a big gap in the data warehousing field: training. The companies this spring will begin offering a five-day course in which users build a data warehouse using multiple vendors' extraction, modeling and query tools. Cost of the courses taught at users' sites will range from \$2,200 to \$2,500.

HP bundles database

Hewlett-Packard Co. officials said the company will bundle Informix Software, Inc.'s new Universal Server database with high-end models of its Domain Enterprise servers for Web applications. The Domain XE packages that will include the Informix database are scheduled to ship next summer. HP also will integrate other Web-related software from Informix, including its Universal Web Connect middleware.

Web group backs HTML 3.2

The World Wide Web Consortium iast week endorsed the Hypertext Markup Language (HTML) 3.2 specification, which it developed last year with several vendors. The specification adds features such as tables, applets, text flow around images, superscripts and subscripts. It is also backward-compatible with the current standard, HTML 2.0. The specification must be approved by the Internet Engineering Task Force to become a standard.

Internet spec for banks due

Microsoft Corp., Intuit, Inc. and CheckFree Corp. have announced plans to create a single, unified technical specification that would allow financial institutions to exchange financial data with customers over the Internet. A draft of the Open Financial Exchange is available this week at the vendors' Web sites. A final version of the specification will be published in mid-February.

EARNINGS WRAP-UP Intel Corp. racked up revenue of \$20.8 billion and earnings of \$5.2 billion last year. Fourth-quarter earnings were \$1.9 billion on revenue of \$6.4 billion. ... Digital Equipment Corp. eked out a \$32 million profit on revenue of \$3.36 billion for its second quarter, ended Dec. 28. ... Sun Microsystems, Inc.'s earnings jumped 41% to \$178.3 million on revenue of \$2.08 billion for the quarter ended Dec. 29. ... NetFrame Systems, Inc. said it expects to report an operating loss for the quarter ended Dec. 28. ... Chip vendor Advanced Micro Devices, Inc. reported a net loss of \$21.2 million for its fourth quarter.

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Tools peer inside client/server apps

Rmon 2 standards are approved; first wave of products hits market

By Patrick Dryden

REMOTE MONITORING (Rmon) standards were approved last week that pave the way for tools that give managers a

clearer view of what is happening inside collectors from multiple vendors. client/server applications.

The first wave of compatible products hits the market this week with the intro-

Concord Communications. Inc. is launching an automated performance analyzer called Traffic Accountant. duction of software that monitors data which can seek and interpret data supplied by compatible devices from 3Com Corp., Bay Networks, Inc., Frontier Software Development, Inc. and Hewlett-Packard Co.

And International Network Services, Inc. in Sunnyvale, Calif., opens up its World Wide Web-based performance monitoring service to support hardware from many vendors.

For the past two years, information systems managers could get reports about traffic at the application level only when hardware and software were provided by the same vendor.

But the enhanced remote network monitoring specification - Rmon 2 approved by the Internet Engineering Task Force, promises a standard way to gather much of the same information.

"For a long time, we've wanted to see what applications run across our network and where users go on the Web, but we could never get inside the client/server transactions," said Joe Askins, director of data communications at Arizona State University (ASU) in Tempe.

ASU managers recently used Traffic Accountant to tap in to diverse sources on their network to track performance and usage. They upgraded the management modules inside Bay Networks hubs and the firmware for stand-alone probes from Concord.

'For a long time ... we could never get inside the client/server transactions."

- Joe Askins,

Arizona State University

'The beta paid off: We've already reduced our overall daytime Internet utilization the equivalent of two Tr connections." Askins said.

For another beta tester, before-andafter utilization graphs helped justify purchases of network upgrades.

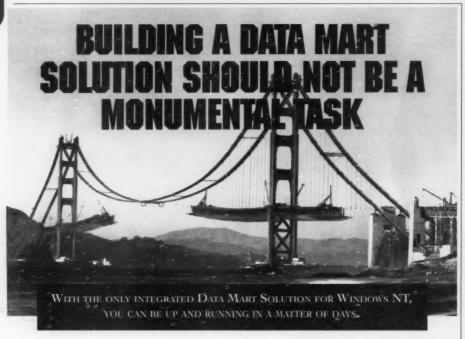
"After installing new equipment, we could show the resulting bandwidth improvements, so the finance folks can't roll their eyes," said Ric Paluch, a senior telecommunications network analyst at Frontier Corp. in Rochester, N.Y.

But some observers see a slow start for standards-based application monitoring because Rmon 2 has gained only "modest acceptance so far," said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston.

Right now, only Bay Networks and Concord can supply the upgrades needed to support Traffic Accountant, which ships this week for \$15,000.

Other vendors should ship compatible - new stand-alone probes and modules that fit inside internetworking devices - by April, according to officials at Concord in Marlboro, Mass.

Probes and embedded modules not only must support the Rmon 2 data formats, but they also require more power and memory to do so. That means buyers must budget for new probes and



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Oracle vs Informix

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Tables	Native Support	Native Support
Text	Native Support	Third Party Datablade
Audio	Native Support	Third Party Datablade
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Oracle® Universal Server® has powerful native support for most every datatype. In contrast, Informix requires you to program or buy third party developed datatypes that they call datablades. Amazingly, a mistake in the datablade code can "shut down the entire server" and may cause you to lose all your data, according to Michael Stonebraker, Chief Technology Officer at Informix. What? Are you kidding?

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Office 97 makes official debut

By Lisa Picarille

AT A SOMEWHAT anticlimactic announcement, Microsoft Corp. last week formally rolled out Office 97, the long-anticipated and much-publicized major upgrade to the industry's best-selling productivity suite.

Office 97 is jam-packed with new features that include Outlook, a desktop information manager; tools for accessing, publishing and importing data from the World Wide Web; features that facilitate sharing and collaboration of documents; and a new graphical interface shared by all the applications.

New applications in the suite include an advanced drawing program designed to compete with CorelDraw, which Corel Corp. has included in its Office Professional 7 suite since it was introduced last spring.

Office 97 also features a few "gotchas" that have some users reluctant to upgrade. Some users have criticized the suite's memory requirements. Microsoft recommends 8M bytes per application, but users say the requirements are even higher.

And then there is the issue of backward compatibility with Office 95. "We are not planning to roll out Office 97," said Ralph Marshall, manager of technology deployment at US Air's information services department in Winston-Salem, N.C., where more than 4,000 users use Office 95. "You can't exchange files easily. I don't need those headaches, so we are sticking with Office 95."

Those issues, along with Microsoft's licensing program that could have corporate users paying up to 10% more than current prices on volume licenses, have analysts predicting a slow sales climb for Office 97.

SOME SUPPORT

Still, the suite has won some praise. Reinaldo Moodey, a design engineer at AT&T Solutions in Filerham Park, N.J., said he plans to move 450 users to Office 97. He said one benefit of the suite is the ability to draw tables easily. "Now, I spend a lot of time creating tables. I have to go through four or five steps. This takes a lot of that out."

But Moodey cautioned that Office 97 won't benefit Windows 3.1 users because it runs only on Windows 95 or NT—upgrades most Windows users haven't undertaken. "When you're looking at this, you're looking at [a product for] more sophisticated users."

Even the most savvy users may need some help, despite Microsoft's efforts to consolidate all its help features into a single place — an animated Office Assistant that steps users through processes.

Microsoft has taken some features that were in Office 95, which came out when Microsoft delivered Windows 95, and tried to make them more accessible. However, users are still slightly overwhelmed.

"It's easier to use, but it has richer functionality. You need to learn how to apply that," Moodev said.

Analysts agreed that Office 97 is an important and technologically advanced product, but "none of that changes the reality of the business upgrade cycle," said Dan Lavin, an analyst at Dataquest in San Jose, Calif. "Businesses upgrade their suites every couple of years — not every year. So unless companies are at the point in their cycles that they are ready to upgrade, they are likely to let this pass."

Still, Lavin said he expects Office 97 to further increase Microsoft's dominant share of the suites market, which ranges between 85% and 90%.

Sections editor Kevin Fogarty contributed to this story.

Is Office 97 open to infection?

Security issues popped up Thursday at the International Virus Prevention Conference '97 in Arlington, Va.

Tim Lebel, Microsoft's product manager for Office, told attendees that Office 97's Word will automatically convert previous Windows 95 Word macros into Office 97's new Visual Basic for Applications macro format. This sparked concern that macro-based viruses could also be converted before specific Office 97 antivirus tools are developed. Microsoft has incorporated code into Office 97 to prevent about 10 of the most popular macro-based viruses, such as Concept, from being converted. But otherwise, there is no built-in macro virus protection in Office 97. In a rather heated session, several antivirus software developers complained they weren't given adequate technical data from Microsoft to create tools for Office 97 before the product shipped. "I know we haven't provided enough information to date," Lebel said. "I really want to get this [relationship] fixed." — Sharon Machlis

McAfee

CONTINUED FROM PAGE 1

could also be a first baby-step in a transformation of the software industry.

Someday, all software updates might be distributed online in background mode, using "push" technology such as BackWeb's.

John Anderson, vice president of telecommunications and computing services at American President Lines in Oakland, Calif., said the push channel could be very useful, but it also could be hazardous.

"You could come in and have 200 machines sitting in your office — and none of them work" if there were a glitch in the automatic software updates, Anderson said. "It'd have to be pretty bulletproof before we and other major companies would turn that loose."

BETA TEST

McAfee, in Santa Clara, Calif., today plans to launch a beta test of the channel for small-office and home users of the software. Large corporate users will get access Feb. 28.

The distribution method is

scheduled to become generally available next month.

BackWeb makes tools for building push-oriented delivery systems, so named because they push information out to user desktops rather than waiting for users to find it at a World Wide Web site.

Other push technology vendors include Marimba, Inc. and PointCast, Inc.

The BackWeb technology can distribute any information, including text files, multimedia files, database updates, software and PowerPoint presentations, said Kelsey Selander, vice president of marketing at Back-Web.

In the McAfee deal, the distribution channel will carry a key component of antivirus software: the "signature files" for new viruses.

VIRUS SQUADS

McAfee, like most antivirus vendors, hires teams of programmers who analyze computer viruses as they are discovered, looking for unique characteristics to identify each virus.

These "signatures" are aggregated into files, which are distributed regularly via disk, online services and McAfee's Website

Corel snags Netscape client suite

By Justin Hibbard

COREL CORP. last week said it has licensed Netscape Communications Corp.'s Communicator client suite and will work with Netscape to integrate Communicator into Corel productivity suites.

Ottawa-based Corel said it will put Netscape's Communicator in its WordPerfect Suite 8 and Corel Office Professional 8, both due later this year.

Corel and Netscape said Communicator will share an electronic-mail address book with other applications in the Corel suites. Communicator will also be able to translate WordPerfect documents into Hypertext Markup Language documents.

Communicator will give Corel's suites an all-in-one desk-top organizer much like Microsoft Corp.'s Outlook, which brings together E-mail, calendaring and documents in Microsoft's Office 97, the vendors said. Communicator can comsaid.

municate with any mail server that supports Internet Mail Access Protocol 4 or Post Office Protocol 3.

LOTS TO PROVE

But Dan Lavin, an analyst at Dataquest in San Jose, Calif., said Netscape still has to prove Communicator will work as it claims.

Lavin said Outlook has hooks that will let users configure it to exchange messages with Lotus Development Corp.'s CC:Mail. Users also may deploy Outlook without its E-mail features and still find it useful, he said.

Users said Communicator will enhance Corel's suites but won't shake up their information systems strategies.

Mike Donnely, IS director at Rogers & Wells, said his law firm uses Corel WordPerfect Suite 7 and that Communicator will make a nice addition to Version 8. But it won't change the New York firm's business practices, he said. The company already uses Novell. Inc.'s GroupWise for collaboration and messaging.

Steven Meyers, information resource manager at a large state agency in Texas, said he couldn't justify using Communicator for groupware because his organization has built an infrastructure around GroupWise. "We have a tremendous investment in GroupWise, and it provides all the functionality of Communicator," Meyers said.

But organizations that don't use proprietary groupware "would probably get a big cost savings" by using Communicator instead, Meyers said. Most proprietary groupware requires each remote site to buy and administer extra server hardware — something unnecessary when using groupware based on Internet standards, Meyers said.

Still, Lavin said Mountain View, Calif.-based Netscape faces an uphill fight in the groupware market, and it will take time for the Corel deal to have any impact.



McAfee will send virus software updates over the Internet

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DataBolts aim to drag surfers to Web sites

By Mitch Wagner

AT NEXT WEEK'S Lotusphere 97, IBM plans to introduce software designed to give developers a drag-and-drop interface for building applications to run on the World Wide Web.

The DataBolts technology will let developers add a searchable library of documents to their Web sites.

The Query & Retrieval DataBolt gives visitors access to documents on business, science and industry-specific information.

The DataBolt will give users more reasons to stay at a site, rather than force them to go to another Web site to pick up that information, said Jeffrey Kay, a software architect at IBM.

NEWS AND COMMERCE

Other DataBolts will include the Profiler, to allow developers to customize views of the content of a Web site based on user preferences; NewsTicker, which provides scrolling, real-time news; and Cryptolopes, IBM's bid to standardize technology for selling information and software over the Internet.

Cryptolopes is different from other sales methods because media-independent files that are 'packed" using Cryptolopes can be distributed over the Internet, electronic mail. CD-ROM. diskette or any other medium.

And the buyer doesn't have to give a credit-card number to the seller or transfer the number over the Internet; IBM acts as middleman in the transaction.

DATABOLTS BY THE DOZEN

IBM plans to roll out about 60 different DataBolts by June. Each DataBolt will be represented by an icon on a palette in a development tool kit.

To add specific functionality to a site, the developer drags the icon for that DataBolt to the workspace portion of the tool set and then customizes the Data-Bolt as needed.

DataBolts are built using Java Beans or ActiveX, so they will run on multiple platforms, including Microsoft's Windows 95 and NT, IBM's OS/2, common Unix variants such as IBM's AIX, and Apple Computer, Inc.'s Macintosh.

Lotus tears pages from its Notespad

By Barb Cole

AT ITS ANNUAL USER conference next week. Lotus development Corp. plans a spate of announcements that are aimed at further breaking up its once monolithic Notes clients and

Lotus will take time at Lotusphere 97 to detail Mad Dog, a strategy that includes a series of clients that range from the full Notes client to a Java-enhanced

The company also will offer a new client, Notes Internet Mail, that is based on the existing Notes Mail client and adds integrated calendaring, scheduling

Product

Six new Java

components

Notes Internet

Domino.connect

NotesPump 2.0

CC:Mail 8

and task management. The company also will take the wraps off a set of Java-enabled components that add charting. drawing, file viewing, spreadsheet and comment capabilities to Notes clients or browsers.

MICROSOFT CHALLENGE

With its new Internet Mail client, Lotus is targeting Microsoft Corp.'s Outlook, the nextgeneration client for Microsoft Exchange that offers similar capabilities. Outlook will appear in the Office 97 application suite and Exchange 5.0.

Kevin Coleman, a Notes administrator at Joseph E. Seagram & Sons, Inc. in New York.

DEBUTING AT LOTUSPHERE

Applets that may be dropped into

browsers or Notes clients, including draw,

file viewing, spreadsheet and note taking

New client for Domino and Notes that

Upgrade of LAN-pased E-mail package

An add-on to Domino for linking up with

A data extraction tool that will gain

additional directory synchronization

will integrate mail and calendaring

functions in one interface

with Web hooks

capabilities

database applications

Description

said he may reconsider deploying Notes Mail to the company's 600 Notes users now that he knows about the Notes Internet Mail client. "Something like this sounds interesting and may be better for us." he said.

The attraction for users is an integrated desktop client that goes beyond the basic mail inbox that browsers provide.

The lack of such an offering from Lotus has already driven some users toward Microsoft.

"We run Notes on the back end but will probably move to Outlook when we install Office 97 at our site," said Patrick Mac-Namara, worldwide manager of messaging at EMI Music in New York, MacNamara said the move wouldn't save EMI money but 'would simplify the desktop."

Besides its client plans, Lotus will advance other key initiatives at the user meeting. The company will roll out an application for its Domino server, called Domino.connect, that will let users link to other databases.

Lotus also is expected to preview CC:Mail 8, a World Wide Web-enabled version of its LANbased mail system, and Version 2.0 of its NotesPump tool with support for Novell, Inc.'s Novell Directory Services.

Microsoft Outlook users see small Internet E-mail improvements, Page 57

Domino server getting document management add-on

Lotus next month will follow up its flurry of Lotusphere announcements by introducing a document management add-on for its Domino server, sources said.

Domino Document Manager is an application that allows the Domino messaging and Web server to manage shared documents that may be changed by multiple

Notes has long been a repository of documents within companies.

But it lacked some key capabilities, such as the ability to check documents in and out or store the pieces of a document in their native file formats.

Besides improving the document-handling capabilities of Domino, sources said. **Domino Document Manager** will keep the contents of Web servers up-to-date and weed out unnecessary documents.

The application is expected to roll out by year's end.

- Barb Cole

Web-based groupware takes on Notes attributes

By Barb Cole

A PIONEER in the World Wide Web-based groupware market is about to make its product a lot more like Lotus Notes.

Radnet, Inc., which sells Web-Share groupware tools, last week announced it is enhancing its software with replication, a full-blown application builder and enhanced security. Those are the very features that helped to make Lotus Development Corp.'s Notes so popular.

'Replication has been a tough nut to crack, so if [WebShare] can do it, that's fantastic,' said Robert Blau, director of electronic publishing services at Simon & Schuster, Inc. in Old Tappan, N.J. The publisher has deployed a WebShare-based sales force automation application to about 6,000 users.

It may act more like Notes now, but WebShare 2.0 isn't likely to woo loyal users from Domino, the Web-ready version of Notes, analysts said, Instead, WebShare will appeal to companies that want to quickly develop Web-ready groupware in mixed messaging and database environments.

VERSATILE INTERFACE

Products such as Domino and Microsoft Corp.'s Exchange require gateways and application programming interfaces to work with disparate mail systems, databases and - on some level - the Internet. But WebShare was designed to fit in to a heterogeneous environment and speak Web protocols.

"[WebShare] works with all

your current stuff," said David Marshak, a vice president at Patricia Seybold Group, a research firm in Boston.

WebShare lets users build applications more rapidly than with traditional groupware environments, said Roy Bean, a senior consultant at the Commonwealth of Massachusetts, which used WebShare to build an application that tracks information technology projects.

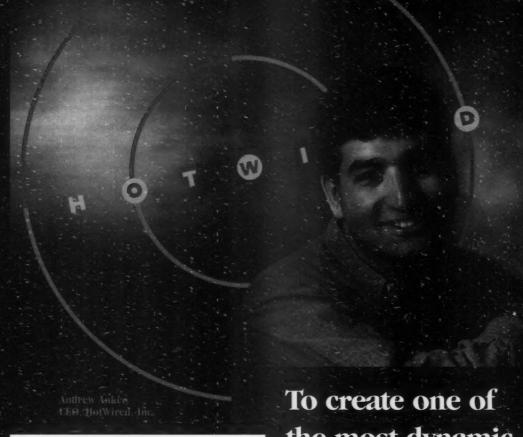
WebShare 2.0 comprises Web-Share Server, a groupware engine that stores the application information; the WebShare Designer application tool; and the WebShare Mobile component.

WebShare and similar offerings from Thuridion and Web-Flow Corp. generated excitement last year when it became clear companies wanted to deploy groupware on the Web. These standards-based offerings were even viewed as possible successors to Notes and other proprietary groupware.

But following aggressive moves by the leading messaging vendors to port their closed groupware platforms to the Web, products such as Web-Share are seen as complementary to core messaging systems.

So although WebShare 2.0 can be run as a stand-alone groupware system, it also can be layered on top of Microsoft's BackOffice or Netscape Communications Corp.'s SuiteSpot. WebShare 2.0 also supports several Web servers, Notes, CC:Mail, Netscape Mail and several SOL databases.

The new version will be available later this quarter.



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us at 1-800-8-SYBASE. It's where the most dynamic Web sites begin.

Mainframe middleware edges toward spotlight

► Candle, Talarian offer new products

By Tim Ouellette

TALARIAN CORP. in Mountain View, Calif., last week released a mainframe middleware product - originally developed for scientific and defense contracts that offers users an alternative to IBM's MOSeries.

Middleware is moving to the forefront of user concerns as they try to integrate different systems, so vendors are scurrying to keep up.

Last week, for example, Candle Corp. in Santa Monica, Calif., bolstered its line of MQSeries management packFeatures of SmartSockets 4.0 for MVS

Publish and subscribe method pushes desired information to target applications

Hot-fallover lets users send or receive messages in real time regardless of whether their primary server is down

Dynamic message routing lets users choose message routing

ages by buying the MQView software module from Apertus Technologies, Inc.

middle-

PUSH

TECHNOLOGY

Message-oriented ware is a layer of software that delivers secure data messages to applications run-

ning on multiple platforms. That way, users avoid the platform-specific communications programming normally required.

Talarian's SmartSockets 4.0 for MVS "pushes" data messages to clients who have "subscribed" to have certain data sent to them (see chart).

For example, telecommunications equipment maker Nortel,

Sockets package to deliver new equipment maintenance data to different groups automatically, said Johnn Dooley, senior soft-

ware engineer at Nortel's Raleigh, N.C., office.

In contrast, IBM's MQSeries works on a "pull" model, in which users request certain data messages.

WER WORKS

Analysts said Talarian's approach, called publish/subscribe, works well in intranet or World Wide Web applications that automatically notify users of changes in Web pages, for exworking on a version of publish/subscribe for MQSeries.

A SmartSockets 4.0 basic configuration costs \$50,000.

Meanwhile, in the blossoming aftermarket of MQSeriesrelated management software, Candle reduced the number of players by buying Apertus' MOView software ICW. Dec. 2. 1996]. It lets users centrally install, configure and monitor MOSeries.

Candle will use the technology in its Command Center for MQ product line, which comwith similar offerings from Boole & Babbage, Inc. in San Jose, Calif.

BM moves AS/400

Conn. "Today [the AS/400] scales as well as any Unix system or better."

IBM officials wouldn't comment on product details or specific delivery times but said they were committed to a 40% yearly price/performance improvement for RISC-based AS/400s and 70% capacity improvement on high-end systems.

The 600 series will put even more distance between older

"They are going to break

open the top end of their

line. Today [the AS/400]

system or better."

Gartner Group

- Tom Bittman.

scales as well as any Unix

CISC AS/400s and RISC

models. That will force users

to either stick with their existing

boxes, known for their reliabil-

ity, or move to new technology.

About 425,000 AS/400s are

installed, and most of them are

CISC-based. But IBM officials

said the move to RISC is pro-

gressing faster than even they

too much neat stuff that runs

only on the RISC machine -

including Internet and Win-

dows 95 and NT server support

their decision to move," said

Dave Peterson, president of

so that these users will make

"Sooner or later, there will be

expected.

Midrange Open Business Strat egies in Rochester, Minn.

Kennebec Health System in Augusta, Maine, added a RISCbased AS/400 last year. But a pending merger with another health system that runs an older CISC AS/400 has Kennebec considering the eight- and 12way systems to manage the combined computing needs, said Bill Terrell, Kennebec's chief information officer.

NO GO

Many of the midsize AS/400 shops that have already moved to RISC models will probably be happy right where they are.

'It would be at least another six months before we could absorb a new operating system [such as Version 4 Release 1]," said David Jones, director of computer services at the State Bar of California in San Francisco, which has installed a RISC

"But we won't need to upgrade to their new high-end models" because the organization is happy with the regular Advanced Server Model 50S that IBM optimized for Internetrelated projects, Jones said.

The 600 series will be based on the Apache processor, a single-chip PowerPC module that will replace the seven-chip PowerPC module found in RISC AS/400s. The single chip speeds up processing times and supports eight- and 12-way

Pyramid unveils a new scalable SMP server. Page 39

· Standard & Poor's lowers rating

Debt burden could weigh down Apple

By Lisa Picarille

THE WAY Apple Computer, Inc. tells it, the firm is sitting on \$1.8 billion in cash, which is enough to buy the company's continued viability and independence as well as drive its turnaround.

But a closer look at Apple's balance sheet shows that the company also has \$1 billion in debt that's due in the first half of the year (see chart).

"Apple is not in great shape in terms of real cash that is usable for all these great turnaround efforts because they have a high level of debt," said Jeff Matthews, general partner at Ram Partners LP, a Greenwich, Conn.-based investment firm. "They are just not generating enough cash flow.'

"Apple is not in a good cash situation." added Charlie Wolf. an analyst at Credit Suisse First Boston Corp., a New York investment banking firm. "I'm not saying they are having a liquidity crisis, but it will be very difficult for them to survive as an independent entity with their current business model."

APPLE'S TAKE

During a teleconference with financial analysts last week, Apple Chief Financial Officer Fred Anderson called the company's liquidity "very solid." And at a briefing at Macworld Expo earlier this month, Marco Landi, Apple's executive vice president, said the \$1.8 billion will allow Apple to "make the investment to execute our strategy."

Macintosh users don't seem

APPLE'S CASH CRUNCH	
Short-term debt	
Estimated cost to acquire Next	\$400M
Loan due in the first half of 1997	\$180M
Cash as collateral for letters of credit	\$177M
Fiscal Q1 loss	\$120M
Estimated Q1 restructuring charge to be taken Q2	\$100M
Conservative projection of Q2 potential loss	
Total	\$1.03B
Long-term debt	
Loans and convertible bonds due 2001	\$661M
Loans and convertible bonds due 2004	\$3M
Total	\$664M
Total debt	\$1.68%
	THE RESERVE

fazed by the financial situation.

"I don't think they will achieve profitability in the near future, but that is not stopping us from buying more Macs this year," said Stuart Greenfield, a systems analyst for the state of Texas in Austin.

Joyce Croker, assistant systems editor at The Los Angeles Times, which has 650 Macintoshes and 3,000 Pentium PCs, said, "It worries me a little bit and gives me pause, but I'm keeping my fingers crossed that they will get it together."

But the financial community is more pessimistic.

Standard & Poor's, a major New York bond rating company, last week downgraded Apple's cash position to "adequate." S&P also lowered the company's corporate rating and issued a "negative" outlook on Apple.

Earlier this month, the Cupertino, Calif., computer maker posted a \$120 million loss for its first fiscal quarter of 1997, which ended Dec. 27, 1996. Apple also reported revenue of \$2.1 billion, 33% lower than last year.

Anderson said Apple isn't expected to turn a profit until the end of the July-to-September quarter, rather than the current quarter as originally projected. That means it is likely to dip further into its cash reserves.

"This is not a bottomless well," said Vadim Zlotnikov, an analyst at Sanford C. Bernstein & Co., a New York-based investment banking firm. "Cash is going to get really tight after the current quarter. The pressure is on Apple to hit sustainable levels of profitability.'

Firms go offshore for cheap year 2000 fix

CONTINUED FROM PAGE

grams — representing about 24 million lines of code — to one of the companies.

The company won't disclose what it spends on outsourcing but estimates it has saved at least 20% so far. Going forward, "we could continue to see significantly more savings," said Manuel Cancel, manager of the year 2000 project at Con Edison.

Once the decision was made to outsource, "we looked offshore because it was cheaper," said James Fox, director of information systems at Union Pacific Railroad in Omaha. The company recently outsourced a part of its conversion work to HCL America, Inc., a U.S. subsidiary of an Indian firm. The deal is valued at \$5,3 million.

"We are definitely seeing this as a trend," said Howard Rubin, president of Rubin Systems, Inc., a market research firm in Seaford, N.Y.

"These outfits are like the Wal-Marts of software," Rubin said. "Whatever the reason people give for going there, it is the cost they went shopping for."

In quarterly surveys, Rubin's company tracks various aspects of information technology management and costs a 200 U.S. corporations. According to its estimates, about 15% of those companies are moving toward outsourcing their year 2000 work. Of those outsourcers, at least one in four is moving the work offshore, Rubin said.

Other analysts agreed. "About 10% of our clients are actively outsourcing right now. About 40% are planning to within the next year or so," most of them with offshore firms, said Capers Jones, chairman of Software Productivity Research, Inc. Driving them there are the lower costs and the relatively abundant availability of Cobol programmers overseas, he said.

In most countries where year 2000 work is done, the education systems — combined with government and private-sector support — are producing large pools of low-level computer talent, analysts said.

Software Productivity Research in Burlington, Mass.-based handles year 2000 consultancy work for a dozen companies per month on average, Jones said.

DECREASE IN QUALIFIED LABOR

The decreasing availability of qualified labor in the U.S. and an unwillingness to divert scarce IS personnel from current tasks to year 2000 work also are cited by observers as reasons for the trend.

"We are in the middle of a merger with another railroad, and we need our IT employees working on that merger as much as possible," Fox said.

"We realized early on that if we addressed the conversion issue ourselves, any ongoing work we had would come to an absolute halt," Cancel said.

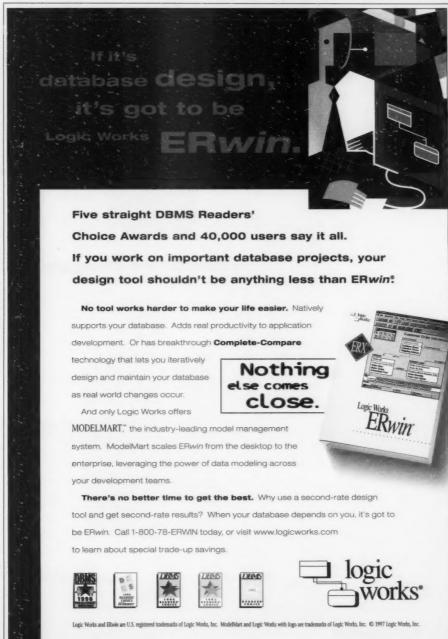
The trend has meant big business for programming shops in countries such as India, Ireland, Israel and the Ukraine, analysts said. "You are spending money that does not earn you one dollar of profit. So if you can pay \$50 to get a job done instead of \$100, which would you choose?" asked James Thomas, vice president of marketing at Tata Consultancy

Services (TCS) in Dallas. TCS, India's largest software firm with offices in the U.S., is involved in nearly 50 year 2000 projects worldwide — most of them with U.S. firms.

Analysts estimated that overseas companies typically charge 40% to 50% less than U.S. outsourcing firms for the same job. For example, work for which an average U.S. programmer would charge \$60 per hour would cost \$20 to \$25 per hour in countries such as India or Ireland.

And it costs about half that in countries such as thew Ukraine, analysts said.

Although telecommunications and travel costs typically add to that figure, the final price tag is still substantially lower than it is in the U.S.







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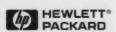


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Yeah, we sell those ... let me check

Internetworking mergers leave sales staff uninformed on their own products

By Bob Wallace

THE FRENZIED PACE of internetworking mergers is making it tough for information systems managers to find vendor sales staff and systems engineers who fully know their own product lines.

"It's going to worsen [as industry consolidation intensifies] and affect users that buy anything beyond core products from their vendors," said Tom Stenson, a network manager at State Street Bank & Trust Co. in Boston.

The problem is particularly noticeable in the internetworking industry because

of the pace of consolidation that market is undergoing, analysts said. For example, Cisco Systems, Inc. and 3Com Corp. each have acquired six companies since January 1995.

"It wreaks havoc on future projects because it means I have to rethink what I'm planning and often start from scratch," said James Wiedel, director of networking at the University of Southern California in Los Angeles.

"I've run into a company where the router salesman doesn't know squat about any other products his company now sells. And I've run into a company where the remote access salesman doesn't know anything about remote access products his company got through an acquisition," Wiedel said. "And we're not talking about a short duration, either. This goes on for a while, sometimes for more than a year."

Users also worry that resellers are being left in the dust. "One thing we look for is reseller systems engineers that are trained on the whole product line of the companies whose products they sell," said Barry Gillespie, network services coordinator at St. Jude's Children's Hospital in Memphis.

"It's going to worsen [as industry consolidation intensifies] and



affect users that buy anything beyond core products from their vendors."

– Tom Stenson, State Street Bank

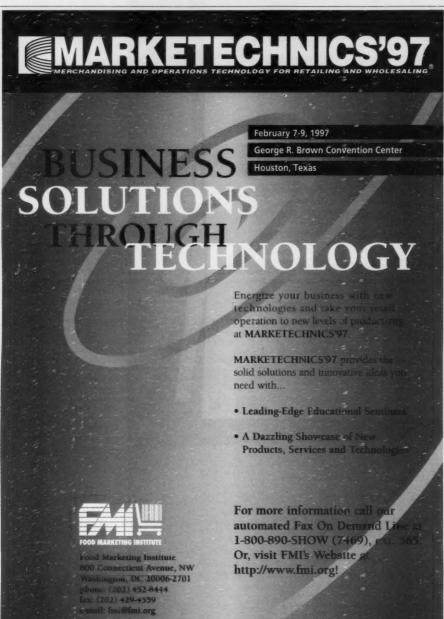
"But after the merger that formed Bay Networks and the 3Com/Chipcom merger, the resellers' sales representatives and systems engineers didn't even know ... model numbers. It was a pretty scary time," Gillespie said. "We try not to slam anyone, but these situations force us to deal direct with the vendors involved or look at another supplier."

Other users agreed.

"We try not to use external sales channels because of this [phenomenon]," said Dave Meyer, a senior network engineer at the University of Oregon in Eugene. "We deal directly with Cisco. The problem is a pretty tough one all around, especially for users looking to buy products from companies their vendors acquire."

Internetworking vendors acknowledged the problem.

"When companies use acquisitions to fill out their product lines and innovate, they create tension for users," said Jeff Thermond, vice president of system marketing at 3Com. "We've done 14 acquisitions, but I wouldn't portray that we have everything sewn up here because we learn something new with every one."





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Telecoms are fueling merger mania

By Kim Girard

THE MERGER MANIA of 1996 should continue throughout 1997 as telecommunications companies scramble to gain market share in an age of deregulation.

Users should expect local service

prices to dip slightly this year, mostly in urban areas where competition is the hottest. But long-distance companies that are protesting the terms of the Baby Bell invasion of their turf are slowing the process to a crawl.

While local carriers aren't expected to

widely invade the \$75 billion longdistance turf until next year, competition for a piece of the \$90 billion local market has already begun.

To compete, long-distance giants and the regional Bell operating companies (RBOC) are working toward one-stop shopping for business customers, analysts said.

Doris Brewer, telecommunications manager at Bally's Park Place casino resort in Atlantic City, N.J., said telecommunications deregulation has proven to be a double-edge sword.

Lower prices are inevitable, she said, as Bell Atlantic Corp. and AT&T Corp. jockey for her business. The company recently renegotiated its long-distance contract with AT&T, knocking several cents off its per-minute rate for the next three years, Brewer said.

The downside in the new market, she said, is that many more second-tier providers are knocking down her door. "It becomes an annoyance," she said.

These alternative carriers will become increasingly vulnerable under deregulation, where the mood is merge or die, analysts say.



Source: Securities Data Co., Newark, N.J.

Teleport Communications Group, the largest of the alternative local phone service providers, is among the companies rumored to be a possible takeover candidate

If acquired, Teleport would join a growing list of acquired companies, which was kicked off last year by the mergers of Bell Atlantic with Nynex Corp. and SBC Communications, Inc. with Pacific Telesis Group.

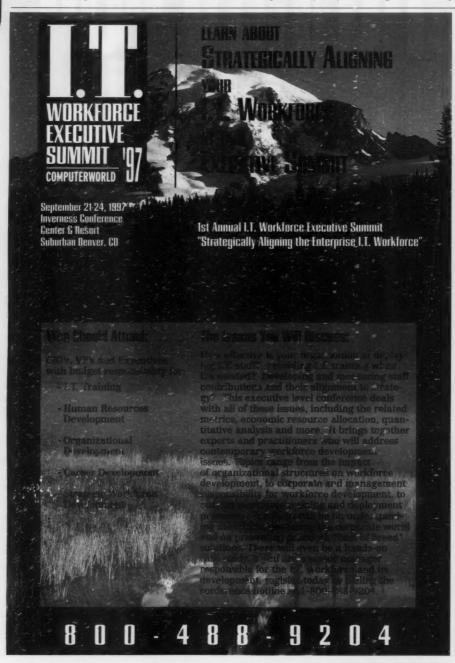
GTE Corp., the subject of merger rumors for months, explored a possible allaance with MCI Communications Corp. before the MCI/British Telecommunications PLC deal was announced. And there has been speculation surrounding a GTE/WorldCom, Inc. partnership.

Users can expect more deals among the remaining independent RBOCs — US West Communications, Inc., Ameritech Corp. and BellSouth Corp.

Utility companies — big players in the telecommunications market due to their ownership of rights of way — also may acquire a carrier or two, analysts said.

Raghu Ram, an analyst at Wheat First Butcher Singer, an investment bank in Richmond, Va., said this year companies will pull together merger strategies to provide bundling of all services.

"Three years from now you won't be calling me and asking, "Who's your local provider?" "he said. "One company will do everything."



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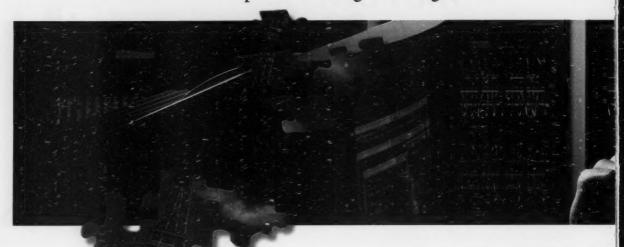
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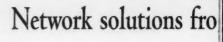
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High tech dominates new factory

▶ \$130 million project showcases latest automation software, networking

By Matt Hambler

NEXT MONTH, under an ambitious rebuilding program, Malden Mills will open a new 600,000-sq-ft. factory building at a cost of \$130 million. It will be filled with dozens of new dye and finishing machines that will be PC-controlled via human/machine interface software—primarily InTouch and InTrack from Wonderware Corp. in Irvine Calif

InTouch is widely used for machine controls, such as how hot a fabric dryer is set or how quickly fabric is pulled along the line. InTrack will monitor larger processes for such things as how much fabric is produced.

PC-controlled automation software from Siscodata in Italy has been installed in some machines to help inspectors examine and digitally record fabric imperfections and weight. Eventually, the mill will be able to give retail customers, such as

Lands' End or L. L. Bean, Inc., a diskette that contains the digitally recorded inspection of each roll of fabric that can be loaded into a client's PC-controlled cutting machine.

Machine-controlled PCs will be linked to a nerve center over a rooM bit/sec. Ethernet network. Robotics will be used to mix dyes and pipe them to vats where 50-yard-long bolts of fabric are automatically inserted, removed and dried.

SWITCHING TO SWITCHES

Technical services manager Dave Wimberley spent the past year planning for a new global enterprise network to connect the Massachusetts mill with ones in Maine and Germany, and with a customer service center in the Netherlands. The network will function on switches instead of routers, with new PCs that run Windows 95.

"We'll completely eliminate the millennium problem because everything will be new," Wimberley said. "The fire was a bit of a blessing for our move to new network technology."

The mill has also signed a license with SSA, Inc. in Chicago for a business planning and control system, BPCS 6.o. It will help provide the company's 700 customers in 50 countries up-to-the-minute information on their orders and monitor the efficiency of the manufacturing process.

The deal is also risky, performance problems with BPCS 6.0's object-oriented design prompted some European customers to postpone purchasing decisions. But an SSA executive claims the product has been in use for nearly a year at 300 other companies. He claimed that once installed, the product should cut the supply chain cycle time in half.

Analysts William McSpadden and Bruce Richardson both said the Wonderware and SSA prod-



ucts, especially, will put Malden Mills at the forefront of information and automation technology. The improvements should enhance the company's bottom line, they said. But McSpadden, president of Plant-Wide Research Group in Billerica, Mass., said the company will need a future version of BPCS to allow its customers to order over the World Wide Web.

Disaster sparks mill's IS overhaul

CONTINUED FROM PAGE 1

planning and operations, got the call. He said the company hopes that using a top business manager instead of an 15 manager to run the so-called Merrimack project will "help give customers what they want: timely information about their orders

and an ability to deal with the company electronically."

Separately, automation experts were dispatched around the globe. Their mission was to find the best textile manufacturing innovations in the world (see related story, next page).

The goal was to replace aging information technology in order to gain better control of production, inventory and automation processes. The entire project is expected to be completed in the next 18 to 36 months.

William L. Baggeroer, Mal-

den's vice president of IS, hadn't even reported for his first day of work when the fire hit. "The [II p.m. news] report said Malden Mills just blew up, and I saw this blaze that looked like Hades and thought, "My God, it's gone."" he said.

When a worried Baggeroer called in, he was told to help set up a new IT system. The idea behind the system modernization plan was to fundamentally change the company "to make it more customer-focused instead of only manufacturing-focused," he said.

A bold undertaking, to be sure. But Feuerstein and his financial managers expect a huge return on what could be a \$15 million investment. "It will come back many times in coming years by having customers give us preference," Feuerstein said. The investment is also expected to position the mill well ahead of its competitors.

The mill's IT vision is even more impressive, considering that the company, which was already struggling to rebuild its physical structure, could have held off on the systems revamp. Although flames swept through three century-old mill buildings and seriously injured 12 work-

ers, the IS infrastructure was mostly spared.

Indeed, the day after the fire, the Hewlett-Packard Co. HP 3000 mainframe system was running, churning out the next week's payroll and staffing information. Only 10% of Malden's systems were lost, but that included some irreplaceable screenprint patterns.

HANDS-ON RESCUE

At one point during the blaze, however, the wind shifted and put the data center at risk.

Data center manager Al Autieri Jr. recalled driving to work, ordering the center closed and sending the overnight IS workers home. He decided to rescue hundreds of data storage tapes himself. "I grabbed them up any way I could in a panic and loaded them into a van," he said. He drove the van to his home until everything was settled several hours later.

As it turned out, the data center was spared, and it took hours to return the tapes to their proper order. Nearly all the vital corporate records were regularly backed up and stored by a contractor miles away, but "saving the most up-to-the-minute data somehow seemed vital at the

A COMPLETE OVERHAUL

The December 1995 fire at Maiden Mills destroyed only about 10% of the company's IT infrastructure, but management plans to replace nearly everything in a modernization effort

PRIOR TO FIRE	FIRE DAMAGE	CURRENT PLANS
Mainframes: 5 HP 3000s	Spared	To be replaced with products running Unix, Windows NT, SSA's BPCS 6.0
HP and IBM PCs running Windows and DOS	300 destroyed	Being replaced with Hewlett-Packard PCs running Windows 95
Network routers	Spared	To be replaced with switches
Some manufac- turing machines were automated	300 machines destroyed or damaged	Replaced or being upgraded to Wonder- ware's InTouch and InTrack, which are being installed to handle major dye and finishing-processing machines

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 23. Dir/Mgr. Sys. Development, System
 Architecture.

- 60. Sys. Integrators/VAPu/Consulting Management General Mgr. 10-President, Owner/Partner, General Mgr. 12. Vice President 13. Tressurer, Controller, Flansnickl Officer DEPARTMENTAL MANAGEMENT 10. Seles & Migh, Management 70. Medical, Legal, Accounting Mgr. OTHER PROPESSIONAL MANAGEMENT 60. Information Centers/Lbraries, Educators, Journalists, Students 90. Other Titled Personnel 5

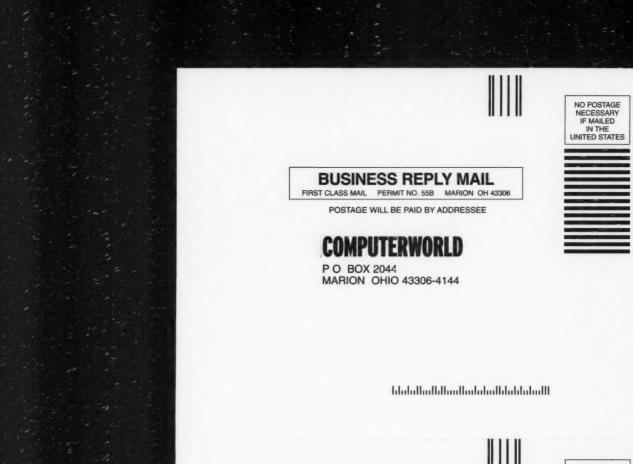
- 3. Programming Management, Software
 Developers
 Develope

 - Intrinet Products

 4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply, (a) internet software (b) in Internet browsers (c) in Web authoring/development tools

 - 5. Do you use the Internet?

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MALDEN MILLS: IS REBORM

REINVENTING THE SHOP FLOOR

Search for innovations spans industries, globe

By Matt Hamblen

FOLLOWING THE devastating fire at Malden Mills in 1995, Mark Cristiano has racked up nearly 50,000 frequent-flier miles scouting out automation machinery controls and components as part of the rebuilding efforts at the mill.

Cristiano, the mill's automation manager, visited Germany, Italy and Switzerland to meet with machinery and control software vendors. Accompanying him was his boss, Michael Lev, manager of advanced manufacturing technology.

The two men, along with other mechanical and systems engineers, also flew to manufacturing plants, mainly in southern U.S., to see automation systems perform firsthand.

The transatlantic flurry of research was sparked by manage-

on machine-variable speed drives and programming logic controllers after the fire, which destroyed all or part of 300 textile machines and the PCs that controlled them.

'We were given a mission to create the most innovative manufacturing plant in the world," said Cristiano, an eight-year veteran of Malden Mills. "It's been the most exciting year of work I've experienced.

GROUND ZERO

"We were on a trend before the fire toward computer automation." Lev said. "The fire made it easy: Instead of converting machinery, we were able to start from ground zero and have it customized for us. We have the opportunity to use the best software in the world."

"It's best to see [the technol-



ogy] firsthand," Lev said. That's the way I've always done it. But after the fire, it was done in a more intense way."

For example, Lev and his coworkers visited a cigarette maker and even competitors' mills, all to verify that systems worked for them. It might seem unlikely, but Cristiano and Ley said competitors didn't mind sharing insights about automation

technology.

Lev said the competitors know Malden Milis as a worldclass operation. They may have granted Lev and others the tours in hopes of learning more about Malden Mills and its secret Polartec finishing process.

They were trying to get information out of us, I think," Lev

"We were given a mission to create the most innovative manufacturing plant in the world. It's been the most exciting year of work I've experienced."

- Mark Cristiano, automation manager

tions showed that the technology sounded nice, but wasn't proved. "We're on the cutting edge, but not the bleeding edge," Cristiano said.

There will be a big payoff with the new machines, in quality of work and the machines' efficiency, Lev said. "Things will be more consistent, also," he said. "Decision-making is removed from machine operator and the process engineer has control."

time." Autieri recalled with a

The fire destroyed half a fiberoptic loop on the 29-acre campus, half the phones, about 300 PCs in remote locations, 160 printers and part or all of 300 large dye and finishing machines.

The company's research and development and design studios lost some vital data that contained formulas and designs for printing fabric. Some of the fabric designs had to be recreated even though data backup procedures were in place. In one case, data backup tapes for designs were kept in a separate building, but both that building and the one that contained the design PCs were destroyed.

Some data was recovered, thanks to users who had taken PC floppy disks home.

One upside to the fire is that in the aftermath, managers seized the opportunity to reform business practices with technology as soon as Feuerstein decided to rebuild

"To the credit of the executive group, they didn't lose sight of long-term goals," Baggeroer said. "They took advantage of the fire to speed up [these projects]." He was referring to the

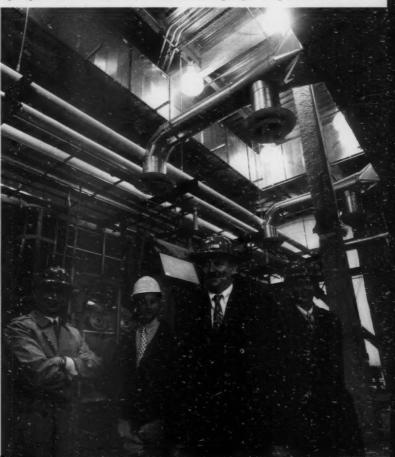
fact that Merrimack, the new systems project, was in its infancy prior to this. The fire gave the program its legs.

'Merrimack will give us many, many things, but one critical thing is it will give customers service and deliveries on time." Feuerstein said.

Merrimack "brings Malden Mills closer to a just-in-time production process," agreed Bruce Richardson, an analyst at Advanced Manufacturing Research in Boston. Such a change means fabric is manufactured to each customer's order instead of being placed in inventory at the mill's expense.

"Sometimes it takes a cataclysmic event like a major fire to bring about profound change in an organization, and that's clearly what's working here," Richardson said. "Left to their own devices, people usually don't make such sweeping changes."

From left: Al Autieri Jr., data center manager; Mark Cristiano, automation manager: William L. Baggeroer, vice president of IS; and Dave Wimberley, technical services manager



Platform	Database/OS	_ Performance/8 perfpmC
Compaq ProLiant 5000	Sybase/UnixWare 2.1	8311/\$95
DEC 4100	Sybase/UNIX V3.2	7598/\$152
Sun Ultra Enterprise 3000	DB2/Solaris V2.1.2	6662/\$152
HP 9000 D370	Sybase/HP UX 10.20	5822/\$148
IBM R56000 J40	Sybase/AIX 4.1.4	5774/\$198



Excuse us if our enthusiasm seems a little excessive. But the most recent TPC results confirm something we're rather proud of: among mid-range servers, the Compaq ProLiant 5000 offers a truly superior level of price:performance.

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Of course, the TPC benchmarks are only part of the reason why the ProLiant 5000 can deliver industry-standard solutions for your enterprise.

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So what's the bottom line?

The ProLiant 5000 offers an unparalleled level of price:performance, reliability, expandability and manageability (sounds like a salesman). Which means better enterprise solutions at the lowest total cost of ownership (sounds like a CFO). Which means you could be setting some records of your own pretty soon.

To learn more about our enterprise solutions, visit us at www.compaq.com.



PINION

Upgrade 97. Have you ever had one of those days when you had

one thing to get done but never got to it because more immediate tasks kept cropping up?

Humorist Patrick F. McManus, who had many of those days growing up in rural Idaho, believes there's a force in the universe that links otherwise unrelated chores into an unbreakable chain.

You want to go fishing, but first you have to dig a posthole for a broken fence. You loaned the posthole digger to the Millers, but the Jones' place is on the way, and you promised to return those tools you borrowed. Then the truck gets a flat. Soon it's too dark to fish.

That's the position you're in if you're thinking of



upgrading to Microsoft's Office 97, the coolest desktop productivity, Internetexploring, groupware suite in the universe.

It runs only on Windows 95 and Windows NT, so you have to come up with a desktop operating system

strategy. Got one? Good. Did you standardize on one or mix them? Are the Macintosh and OS/2 users mad? Don't worry, they'll be happy.

OK, now upgrade that hardware — those Windows 3.1 machines don't have the horsepower to run Windows 95 or Windows NT.

Oops. You use several electronic-mail servers, but Office 97's cool collaborative features work best with Exchange servers. Better install some.

Wait, Exchange runs on NT Server and you run mainly Unix. Better buy some new servers.

OK, you've standardized on your favorite Microsoft operating system, upgraded systems, made Exchange your main E-mail system and added lots of NT Server software.

But wait. Your CEO wants you to cost-justify the upgrades, lay out a product road map and defend your dependence on Microsoft. Go back and do some more research.

McManus not only identified this situation — he even had a solution for it. Just go fishing.

Ken Egats

Kevin Fogarty, Sections editor Internet: kevin_fogarty@cw.com



Readers stoke the flames of the NC vs. PC debate

N THE FORECAST editorial ["NC vs. PC," CW, Dec. 30/Jan. 2], one has to wonder what planet Maryfran Johnson is from.

She asserts that "80% of the business users out there feel more like powerless users — stymied in their work by buggy, bloated software and complex systems that crash for mysterious tech-wienie reasons." At that unbelievable 80% rate, businesses all over the U.S. should be screeching to a halt.

I have created PC-based network systems that deliver continued stability and reliability. It's when trinket-wienies (not tech-wienies) start slapping in cheap virus-detection junk, memory-hogging screen savers and pseudo-tools that everything goes haywire.

Johnson seems to unwittingly define the network computer to its own detriment with the use of the Star Trek example, calling the network computer "a single-function device that relies on a powerful network." That's the very thing users do not want in an age when even the single-function TV is becoming a multifunctional, interactive device. Who wants to be at the mercy of the "great network," especially when it goes down?

David S. Mohler President ClearLogic Corp. Dayton, Ohio. dmohler@clrlogic.com

As BOTH A personal and a business user, I can definitely say that at work I'd really rather have a fully functional network computer. Why? Because I'm not paid to worry about managing and backing up all the crud on this outdated sys-



tem. Who has the time? I need updated software. Do I ever get it in a timely manner? Of course not. The support techs are too busy pulling apart PCs, trying to figure out which hardware component went belly-up this time in offices around the building.

Despite what Paul Gillin writes, many of the trends that were the



the time did indeed impact our industry — and in a positive way. What are intranets but

"latest fads" of

huge client/server systems? That gets to the biggest point I have with this debate.

Why is it "either/or" instead of "and?" I'm looking forward to the network personal computer.

It would store files locally for my personal stuff and pull applications and public files from the central server. I guess I'm not supposed to want the best of both worlds.

> Ry Schwark Basking Ridge, N.J. rschwark@lucent.com

ARYFRAN JOHNSON is right on the money about the network computer. It's not just another Silicon Valley hype.

Unlike the "personal digital playtoy," the network computer is a financial cost containment tool. The Intel/Microsoft push/shove strategy for software, memory and MIPS has run its course with the chief financial officers of the world. My cursory look at the typical corporate PC user finds frustration with the current PC/LAN complexity.

John O'Brien Lawrence O'Brien, Inc. Gaithersburg, Md.

Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include and address and phone number for verification.

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Leadership Series

Be Careful What You Wish For

By Vaughan Merlyn and Sheila Smith

As IS executives, we're great at planning what we want to happen, but we rarely consider the possible unintended consequences of our plans. How can we uncover the unexpected?

opes were high that summer of '95, as the IS management team at a major financial services company created a new vision for planning projects and setting target dates. Collaboration would be key: Business and IS would work together to make the necessary trade-offs to reach solid, achievable target dates for new systems. Business requirements would drive the planning and the trade-offs to be reached around scheduling, cost, quality, scope and resources. Never again would a project be driven by arbitrary end dates. Never again would the delivery date be master and the IS professional be slave.

Six months later, disaster struck. The company failed to

get a key Internet-based product to market in time to beat the competition. Why? The underlying information technology just wasn't ready. The new year began with little to celebrate.

With the new project-planning method, how did this happen? Like a villain kidnapping an innocent victim, something crept up on the project and blindfolded it from behind—an unintended consequence of a well-intentioned change.

Somewhere along the way, the message became garbled. What IS folks heard was, "No more date-driven projects," rather than, "Collaborate with your business partner to set the date based on business needs." And since collaboration wasn't being rewarded, the IS group felt the message was clear: Plan

the project in detail, and tell the business side what the date would be. The discussions never happened; the trade-offs were never made. Had those discussions taken place, the people involved might have opted to get a basic product to market quickly and add more functionality incrementally, reaping the benefits of being "first to market."

Good intentions gone bad are an all-too-common surprise for IS managers. Although most of us are excellent at thinking about what we want to happen—the desired outcomes and the intended consequences—we rarely stop to consider what could happen—the possible unintended consequences. So, what's missing from our efforts that causes these unintended consequences?

Why didn't we think of that before?

t the root of unintended consequences is a failure of thinking. We fail on multiple levels.

The first failure is assuming that IS projects are more logical, straightforward and free of political considerations than they actually are. We have been taught that the world is a simple, mechanistic place. So we plan and analyze under the assumption that there are simple cause-and-effect links between our actions and

In reality, the world - especially the IS world - is enormously complex. Subtle interrelationships, coupled with the natural IS engineering mind-set, become an albatross around IS' neck in terms of anticipating unintended consequences. The engineer designs a logical process that, when followed, is intended to lead to desired outcomes. We need, instead, to think more like ecologists, recognizing the inherent unpredictability of complex systems and looking at the whole environment as we plan and take action.

Take the case of a large oil company at which this "engineering approach" derailed efforts to implement an information technology architecture.

After creating a new IT architecture, the company's IS group established a unit to be the "keepers and enforcers" of the architecture. The unit reviewed all new IS projects to ensure conformance. Within six months, the "architecture police," as they came to be known, were a bottleneck that delayed projects and alienated both business managers and developers. Also, the architecture failed to prevent businesspeople from acquiring their own technologies, regardless of whether these conformed to the architecture. Within the year, the group disbanded.

The simplicity assumed by an engineering mind-set not only resulted in a failure to reach the architecture objectives, but also caused an unintended consemight happen. I always have time to manage; I must make the time to think." This decision-making style, which incorporates a bias for action with little post-action reflection, can make for embarrassing surprises, as described in the following sce-

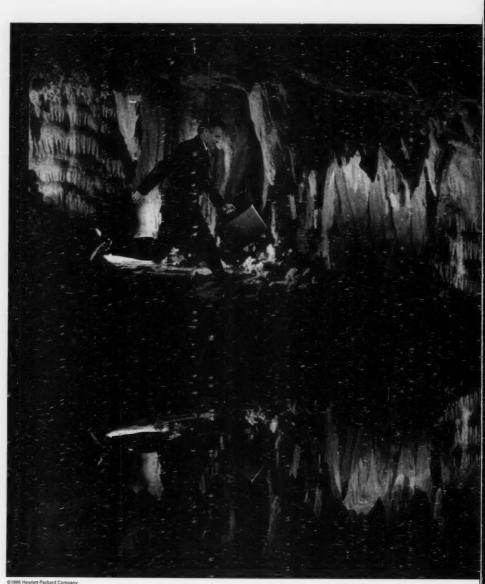
This particular CIO was faced with a problem familiar to many CIOs - dysfunctional relationships between IT and business. The so-

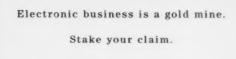


customers and damaging relationships.

The second level of failure is often a matter of decision-making style and a lack of thought about the larger context. One CIO of a global manufacturing company admits the need for a co-pilot to help him think through and spot unintended consequences. "Once I make a decision, I tend never to look back. I need someone right there with me as I make choices, challenging me to think about what

Quickly form a group of senior IS professionals focused on building relationships by consulting with business units about IS needs and structuring projects to meet those needs. The relationships improved at record speed, as requests for IS projects came rushing in, a result of the group's hard work at mending fences. Great news! Finally, the businesspeople were talking to IT about how to enhance their processes using information technology.





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But bad news came fast on the heels of this burst of hope. Lacking a process for prioritizing IT investments, IS was left with a mountain of projects of varying business value and insufficient resources to carry them out. You guessed it: The best intentions of improving relationships actually worsened them when certain requests were denied or deferred. The bias-foraction style, coupled with a lack of thought given to defining the context in which the group would be deemed successful, caused this IS executive a serious embarrassment.

A final level on which we can fail involves our way of viewing technology, which can contribute to unintended consequences. A stark example of how a specific mind-set led to severe, unintended consequences appears in a particular division of a chemical manufacturer. For years, division executives viewed IT as a cost, not an investment. The goal: Minimize the percentage of revenue spent on IT. The IS group complied, reducing the level of

spending to the lowest in the industry. New development was cut, hardware acquisition slowed, and key projects were deferred.

The unintended consequence of this cost minimization goal showed up rapidly and dramatically. Little investment was made to ensure that platforms were common and upgraded consistently. Without common platforms, communication among internal and external customers suffered, and without a proper infrastructure, business growth was hampered. Head count reduction produced lower costs in the IS organization, but business units started to hire their own IS people, resulting in hidden costs in the form of a shadow IS organization. Those good intentions born of a specific mind-set about IT costs inadvertently resulted in higher IS costs.

Uncovering the unexpected

abbing unintended consequences before they nab you is the name of the game. A few simple techniques can help.

One is to analyze unintended consequences up front. Try the following quick exercise to help you think through what might happen in a given situation. (See "The 'What Could Happen' Test" on page 7 for how this exercise works for the project enddate example mentioned at the

beginning of this article.)

First, clarify what you're really after. Start with how the desired situation is framed (in this case, from the perspective of the IS professional) and the intended result. Then ask yourself, "What could happen if the change is not handled properly?" Think about role confusion and likely misinterpretations.

This exercise will not only alert you to possible unintended consequences, but it may also

IS and the art of cooking pigs

"The reason IS management actions often lead to unintended consequences is a failure of theory. When managers see something that doesn's fit, they use a technique they are comfortable with — going after more data. We don't need more data, we need more thinking. Think, learn, examine. These are the tools to avoid unintended consequences."

So notes Barry Stein, president of Goodmeasure, Inc., a Cambridge, Mass.-based organizational change consulting firm. To highlight IS managers' tendency to react to symptoms

without fully understanding underlying problems, Stein draws an anology, relating an essay by 19th-century British writer Charles Lamb, in which Lamb imagined how humanity discovered cooking.

Millions of years ago, Lamb supposed, people lived in large extended families, with domestic animals, in crude houses built of wood and thatch. One day, a house caught fire; the only casualty was a neighborhood pig. When the residents returned, all that was left was a plume of smoke, a pile of ashes and a wonderful smell. Eventually,

some of the people poked in the ashes and burned their fingers touching the carcass of the still hot, incinerated pig. When they put their burned fingers in their mouths to cool the burn, a delicious taste appeared. They had, Lamb said, discovered cooking.

said, discovered cooking.

Thereafter, when the people of the village wanted to celebrate, they picked out a house, put a pig inside it and burned the house down.

The moral, according to Stein: "If you don't understand what's cooking the pig, you are going to waste an awful lot of houses."



as stated is not the one you want.

The financial services company mentioned in the example did not really desire a state in which "projects are no longer driven by arbitrary target

uncover that the desired situation dates," but rather one in which "project target dates are estimated collaboratively by IS and the business customer, based on business requirements, a project plan and a discussion of tradeoffs among schedule, cost, qual-

ity, scope and resources."

Once you're clear on what you're after, examine the elements of what is desired (such as collaboration, planning, open discussions of trade-offs) and ensure that a common understanding of these elements is shared by those who must change. For IS's internal customers, planning IS projects may be a whole new experience. You must anticipate the customers' confusion and address it, or be ready for unintended consequences.

Next, anticipate that people will act according to incentives and rewards. Naomi Bloom, managing partner at Bloom and Wallace, a consulting firm in Fairfax, Va., that helps organizations re-engineer their human-resource business process, concurs. "Even if people understand what is expected, they only behave that way if all the supporting human-resource management elements are in place," Bloom says.

Causal loop diagramming is another technique that will help you look at an issue holistically and anticipate unintended conse-

The "What Could Happen" Test Stated Desired Situation **Possible Unintended** Intended Consequences Projects are no longer driven by arbitrary target dates. eas burnout of and stre

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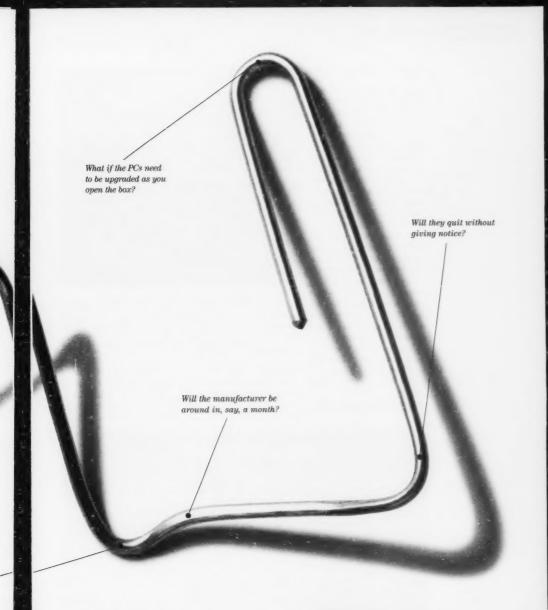
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quences. This diagram was originated by MIT Professor Jay Forrester and popularized by Peter Senge, author of *The Fifth Discipline: The Art and Practice of the Learning Organization* (Doubleday, New York, 1990), and Pegasus Communications, Inc., a Cambridge, Mass., publisher of the *Systems Thinker* newsletter. This technique would have been invaluable for the CIO who was trying to mend relationships and ended up destroying them instead. (See chart above.)

Spotting unintended consequences in the making is like sending out scouts to see what lies ahead. It's also similar to looking for emerging scenarios in scenario planning, which anticipates different future business worlds. As Peter Schwartz advises in The Art of the Long View (Doubleday, New York, 1991), "In the real world, you don't know ahead of time which scenario will take place. But you prepare for several of them, and then train yourself to look for one or two small details so that you can recognize the full sce-





Causes and Consequences

The Relationship Managers generate a huge demand for IT services, initially increasing customer satisfaction and relationship with IT. But as demand increases without a way of prioritizing orders or increasing resources, delays in servicing occur and customer satisfaction and relationship with IT deteriorate.

nario before it happens."

We don't know which unintended consequence might happen, so we prepare for each, noting hints of trouble (see "Signs of Trouble," below). The chart shows an example of how the financial services company might have spotted a few unintended consequences in the making.

Signs of Trouble				
Unintended Consequence	Indicator or Sign			
Project scope is larger than necessary: A Cadillac gets built when only a Chevette is needed.	Business community is not active in require- ments analysis and prototyping. No project charter is collaboratively developed with this business:			
	The business side seems disconnected with the project team.			
Business misses opportunities to get products to market in a timely, competitive manner.	Timing needs and issues are not discussed as part of the project chartering process.			
	Key business managers who understand marks timing lasues are not part of the project team or are not in the regular review loop.			



From anticipation to action

tended consequence in the making, don't berate yourself. Instead, reflect briefly, then act fast. Here are some guidelines:

- · Don't deny what's happening.
- · Take time to revalidate what you intended to happen. Clarify the intended outcomes by describing them in terms of visible behaviors and day-to-day actions.
- · Step back and see why the unintended consequence came

hen you see an unin- for correction. For example, in the case of the manufacturing company CIO who generated more IS requests than could be handled, several opportunities existed for correction. He could have defined a prioritization process for all IT investments, added more IS resources to meet demand, opened discussions with specific users about their priorities, regulated the new group's interaction with users or pursued some combination of these.

· Consider whether the correc-· See what opportunities exist tive action will cause other unintended consequences.

· Act quickly!

In the manufacturing company example, the CIO realized that as demand built and could not be met, he should not rush off to get more resources, a step that might exacerbate the situation. Instead, after deeper reflection on what he originally intended - building better relationships - he found a way to both correct the unintended consequence and further develop relationships with the users. He used the golden opportunity of working with the business side on a process to set priorities for their IT investments.

Thinking through the issue to ensure you'll get what you want takes a bit of extra effort. The choice is yours. However, if you decide not to spend the time and energy thinking through the possible unintended consequences and how to manage them, be prepared. Who knows what you'll get! .

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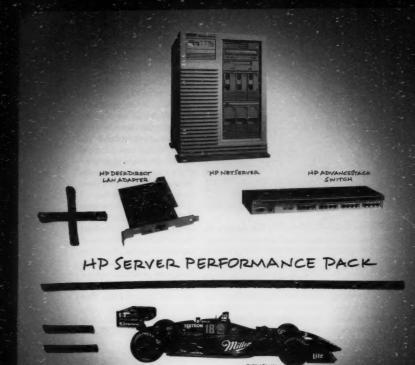
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About the Authors:

Vaughan Merlyn and Sheila Smith are managing partners of Roswell, Ga.-based Omega Point Consulting, where they help Fortune 500 companies increase the value derived from information technology. Merlyn and Smith collectively have 40 years of experience in the IS field. They can be reached on the Internet at vmerlyn@omegapt.com and sismith@

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Futile search for the fountain of reuse

Martin A. Goetz

recent Computerworld article ["Reuse revealed," Oct. 14, 1996] correctly identified the risks of chasing the dream of object-oriented, reusable code. They include "analysis paralysis," high up-front investments in time and money and the chance that reuse will never spread across the organization.

But the article suggests these are just hurdles to be overcome. Not so. Attempts at reusing software objects have been failing for years. Reusability will never become widespread.

For starters, object-oriented programming (OOP) is difficult to learn. Cobol and PL/1 were successful largely because their English-like, procedural statements made

them very easy to learn. Programmers could write application logic in a straightforward, easily understood and easily maintainable manner. By contrast, OOP demands that programmers and designers learn an entirely new and unnatural

Trying to find and maintain reusable code just isn't cost-effective or practical

way of looking at the application as they search for reusable objects.

Don't be fooled by the steady stream of positive verbiage about the theoretical potential of OOP and reusable code. In the real IS world, reuse doesn't work. Study after study

shows that most companies that tried OOP have abandoned it. And those that haven't have yet to develop a significant number of reusable objects.

Why? The simple truth is that trying to find and maintain reusable code for enterprise applications just isn't cost-effective or practical. IS directors should ask themselves why there are so few successes and so many failures in companies that attempted to develop reusable code.

Of course, all IS organizations want to increase productivity and reduce costs and reusing code promises that. But it doesn't deliver. Most enterprise applications are constantly changing to reflect

new company policies, practices and procedures. In a large organization, there are complex interactions among these applications. It may be possible to find reusable objects in this environment, but it will be difficult and very time-consuming.

The applications of midsize organizations typically change even faster. Even if reusable objects can be identified, they probably won't be reusable over a long period of time. Smaller organizations may be the best candidates for developing reusable objects, but the key test is whether the objects remain viable over the life of the application. Today's "success" might be tomorrow's softwaremaintenance nightmare. Although experts have strategies for identifying reusable code, they haven't solved the problem of changing the embedded objects to reflect organizational changes, business mergers or new government regulations

History shows that the time-tested way to improve on third-generation languages such as Cobol - which has seen better days - is through enterprise fourth-generation languages (4GL). They are effective for the life of applications and have the benefit of being as easy to learn as Cobol. Why wade through the swamp trying to find reusable code when 4GLs are a proven alternative to Cobol for improving productivity?

OOP is at least 10 years old. It's been "successful" in a few small IS shops with a handful of OOP gurus. But these are isolated cases. Analysts at firms such as Gartner Group caution that there is no theoretical support for OOP's claims, that OOP is incompatible with relational database technology and that there have been relatively few success stories.

The seductive "benefits" of reusability may seem heaven-sent, but the devil is in the details.

Goetz, a software industry pioneer who received the first U.S. software patent (in 1968), is a management consultant in Teaneck, N.J.

Handhelds hand IS new troubles

John Gantz

got my first Windows CE device last month. I'm were to the starship Enterprise. afraid to touch it. Not that I don't think I could be more efficient with an electronic phone book to carry around or an appointment schedule that doesn't need to be reprinted every few weeks. And I would love to have an electronic-mail terminal that weighs less than a pound.

But this thing is a real computer, and it scares me. What if it breaks? What if I screw up and wind up in the innards of the operating system, not knowing how to get out? What if I forget what those cryptic little messages and icons mean? What if I lose my stylus?

So I loaned it to my company's IS manager. He's scared of it, too.

At the moment, our IS department is feeling G-forces from the roller-coaster ride of trying to beef up our client/server infrastructure and security just when our army of mobile analysts wants remote access to those client/server networks. The way our road-warrior analysts want to open holes in the network to get files and swap information scares the bejesus out of our IS manager.

That got me thinking about Windows CE and the impact of doubling or tripling the computerized mobile work force. We're talking about a mind-numbing array of personal digital assistants, organizers, tablets and smart phones hitting the

If all those handheld devices are used only for E-mail and personal organizing, then IS departments can cope with relative ease. But once the handhelds start acting as real remote-access terminals and they will over time - they will be to IS departments what tribbles

I've mentioned the headaches of mobile computing before in this column. But I've also mentioned the incredible benefits of giving mobile and remote users laptop communications and processing. I have argued that it's a good tradethe increased organizational productivity is worth the headaches.

But for handhelds, I wonder if they will really provide the kind of productivity boost that will make them worth the support effort, from the enterprise's point of view. I'm particularly concerned about what happens if the market rallies

Winaround dows CE and these devices go from being personal organizers to communicating terminals, browsers and eventually



Handheld devices will be hard to track service and keep secure

mini-notebook computers. Will handhelds be manageable?

One of the reasons notebook computers are manageable is that they aren't as mobile as we think. The No. 1 location for using notebooks is in the home. But Windows CE devices will be as mobile as a coat pocket. They'll be impossible to track and impossible to keep secure. They'll also be impossible to service but easy to replace. They come in all different flavors and configurations. To be useful, they'll need their own software. Yikes. We'll be adding a whole new hodgepodge of devices to evaluate. They'll require the development of training programs and new applications.

So I think my IS guy has the right idea. Handheld devices that run Windows CE - or any other operating system that ships in volume - and are capable of communicating with corporate systems will be deemed "computers." As such, they need to be factored into the total IS equation. And that's a fairly complex equation already.

Gantz is a senior vice president at International Data Corp. in Framingham, Mass. His Internet address is jgantz@ idcresearch.com.

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The NCR legacy lives

DAVID MOSCHELLA

dependent public company ssed quietly. If there was any

CR'S REEMERGENCE as an in- reaction, it was mostly head shaking at yet another botched AT&T computer initiative. Former NCR CEO Chuck Exley

was right. It never should have happened.

However, despite its current low profile. NCR retains a special place in our industry's history. Allow me a few hundred words to make the case that National Cash Register Co. was one

of the four most influential companies in the evolution of the IT industry, right up



there with IBM, Intel and Microsoft.

Most of us know NCR was the dominant supplier of mechanical cash registers. What is largely forgotten is how it became so. As chronicled by Thomas De-Lamarter, Robert Sobel and

others. NCR founder John Patterson was one of our nation's most ruthless competitors. Predatory pricing, control of the used equipment market, frivolous lawsuits, payoffs, slander and even sabotage enabled NCR to grab 90% of the market. Indeed, NCR has the dubious distinction of being the first company ever prosecuted under U.S. antitrust law.

What is also often forgotten is that Thomas Watson Sr. spent 17 years at NCR, where he learned the Patterson system and rose through the sales ranks. In fact, in 1912, Patterson and Watson were found guilty of criminal conspiracy in restraint of trade. The charges were later dropped during the appeals process.

In 1914, Watson became general manager of a new company, the Computing-Tabulating-Recording Co. (C-T-R). Although he shunned Patterson's roughand-tumble tactics, Watson adopted many of NCR's market-control techniques to make C-T-R the dominant supplier of accounting machinery. In 1924, Watson renamed the company International Business Machines. By 1935, IBM had more than 80% of the punch-card business. Government antitrust suits were launched against the company in 1932 and 1952.

You probably know the rest of the story. But isn't it strange that nearly a century of computer-industry leadership can be traced back through a single lineage? Patterson showed Watson how to monopolize a market. Watson sanitized NCR's approach to control the emerging electromechanical data processing business. His son, Tom Watson Jr., preserved IBM's power through its huge transition into the Electronic Age. Then, in 1981, IBM's decision to outsource its critical PC components unwittingly passed the baton to Microsoft's Bill Gates and Intel's Andrew Grove. A trillion-dollar industry now wonders what happens next.

Perhaps we shouldn't be surprised that our technology-driven industry often overlooks the roles of individuals. But were it not for the lessons of Patterson and the immense drive of Tom Watson Sr., the computer industry's strange pattern of monopoly vendor leadership might never have emerged. If IBM hadn't been so dominant, Intel and Microsoft probably wouldn't be in the same position today. Who knows what our industry might look like?

When this industry tries to understand why things are the way they are, John Patterson and NCR loom as large as anyone. Monopoly power remains our industry's defining competitive force.

Moschella is senior vice president of research at Computerworld, Inc. in Framingham, Mass. His Internet address is david_ moschella@cw.com

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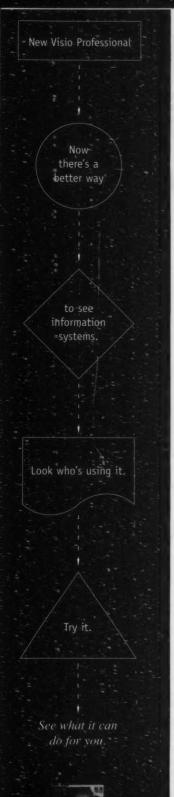
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Servers & PCs

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New chip in Sun servers

Sun Microsystems, Inc. has re-freshed its line of Ultra Enterbased on its new 250-MHz UliraSPARC chip. Users can upgrade by reptacing their 167-MHz processor boards with cards that contain the chip.

Big iron speed, LAN cost General Signal Networks in Shelton, Conn., is shipping ds of up to 17M byte/se

Amdahl: New RAID

Amdahl Corp. is upgrading its LVS 4500 RAID disk array by adding 3.5-in., 9G-byte hard drives from Sengate Technol-ogy, Inc. Available Feb. 10, the new LVS 4500 will hold up to 319G bytes of data in an 8-square-foot chassis. The cost will average less than \$1 per megabyte of stored data.

RATING RAID

The RAID Advisory Board. comprised of 50 storage vendors that market RAID systems, has scrapped its old RAID 0 to 5 rating system. The new scheme has three classifications:

- # Failure Resistant Disk Systems (FRDS)
- Failure Tolerant Disk Systems (FTDS)
- Disaster Tolerant Disk Systems (DTDS)

Objects for OS/390

lows, Unix and Java front systems via Com

riefs SMP server debuts

ENTERPRISE SYSTEMS vendor Siemens Pyramid Information Systems, Inc. last week boosted its high-end Unix server lineup with models based on the 200-MHz MIPS R10000 chip.

The RM600 E20 and E60 models, which are successors to Pyramid's older Nile servers,

Uniform Memory Access (CC-NUMA) technology and support up to 24 processors.

CC-NUMA is an architecture SMP servers, page 41

PYRAMID'S RM600 E

- Processors: Up to 24 MIPS R10000s (200 MHz)
- Second-level cache: Up to 4M bytes



Vendors' new PC spec is a power play

By April Jacobs

MICROSOFT CORP., Intel Corp. and a third vendor have published a specification for PC power management designed to speed boot times and automate tasks such as shutting down peripherals.

The Advanced Configuration and Power Interface (ACPI) Version 1.0 specification will enable PCs to power up more quickly

ACPI BENEFITS

- Speeds boot-up time
- Enables PCs to have a low-power sleeping state
- Lets PCs turn peripherals on and off

tasks, such as memory checks, after they are shut down in a low-power "sleeping" state. The third vendor, Toshiba America Information Systems, Inc., also published the specification.

The specification could be a boon not only to end users, but also to information systems managers who now have to configure shutdown processes on PCs for peripherals such as network adapter cards and hard

Joe Pucciarelli, an analyst at Gartner Group, Inc. in Stamford, Conn., said the ACPI specification addresses a highlevel issue for PC makers and a bottom-line issue for corporate IS managers.

Vendors such as Microsoft and Intel are using ACPI to make PCs more attractive in the

New PC spec, page 41

DATA STORAGE

Open systems devices expected to capture large share of market

By Tim Ouellette

USERS WHO RUN a mix of servers are looking for a single storage system to handle them all.

Such a system is a switch from server-specific disk storage devices and mainframe-only storage systems that exist in data centers around the world. But International Data Corp. in Framingham, Mass., expects the open systems storage market, where a disk system attaches to multiple server platforms, to account for 66% of the total storage market this year. Host-based mainframe and midrange storage will make up the rest.

We needed to improve the availability of systems and move into a RAID-type environment, but we didn't want the performance penalties associated with host-based RAID," said Bill Martin, vice president of networking and telecommunications at Kelly Services, Inc.

The Troy, N.Y., firm is an early user of Sun Microsystems, Inc.'s new open systems disk

Sun's RSM Array 2000, which will be announced this week, will be able to run off Microsoft Corp.'s Windows NT and Hewlett-Packard Co.'s HP-UX servers by midyear. The highavailibility disk array has no single point of failure and will cost less than \$1 per megabyte of data stored.

Sun's current SPARCArray disk systems run off Solaris servers only.

'Long term, this may work for us, as we are looking to open up our server environment." Martin said.

'Long term,"

this may work

- Bill Martin

Kelly Services

for us."

Other users are already at that point.

For example. Kredietbank in Belgium recently bought \$10 million worth of Storage Tech-

nology Corp.'s Openstorage Disk Subsystems. Kredietbank uses HP 9000 servers. Although it bought internal disk systems from HP, the bank decided to improve performance and flexibility with an external

HP teamed with StorageTek to provide the latter's open systems storage products. Systems

Open systems storage, page 40

Extreme density

Researchers at IBM recently demonstrated components that read and write data on a computer hard disk at a density of 5G bit/sq. in. Five billion bits (5G bits) of data equal the text on 312,500 double-spaced, typewritten pages.

Current density for leadingedge disk drives is around 1.36G bit/sq. in., according to Disk/Trend, Inc., a market research firm in Mountain View,

IBM has been the technology leader in improving the density

of hard disk drives, said Robert Katzive, an analyst at Disk/

Such a demonstration "is usually a good precursor of products to come. In the past, IBM has done demonstrations and followed them up within a few years" with products on the market, Katzive said.

He added that this hard-disk technology has, in the past, had the most impact on the 2.5-in. disk drives used in notebook

NEW PRODUCTS

TEXAS MICROSYSTEMS, INC. has announced the SP5500, a server that supports as many as four Pentium processors running at up to 200 MHz.

According to the Houston company, the server accommodates up to 768M bytes of main memory using two plug-in modules.

The SP5500 costs \$5,650.

Texas Microsystems (713) 541-8200 www.texmicro.com

CYGNET STORAGE SOLUTIONS, INC. has announced Infinidisc Robotic Compact Disc Library, with room for up to 500 discs and four CD drives.

According to the San Jose, Calif., com-

pany, Infinidisc provides storage costs for as little as 4.2 cents per megabyte in a two-drive, 500-disc unit and up to 8.7 cents per megabyte in an eight-drive, 250-disc unit.

A four-drive, 500-disc unit costs \$14,895.

Cygnet Storage Solutions (408) 954-1800

MICROBOARDS TECHNOLOGY, INC. has an-

nounced a compact disc duplicator, the CD Blaster II.

According to the Chanhassen, Minn., company, when a user loads a CD in the multiformat CD duplicator and presses a button, the system delivers an exact duplicate within a few minutes.

Pricing starts at \$2,995. Microboards Technology (612) 470-1848 www.microboards.pcall.com

FREEING UP STORAGE SPACE

Users are seeking storage products that aren't tied to one server vendor. The sales figures below show that the trend is expected to double the sales of open storage systems in the next three years.

1	internal storage	External open storage	
1995	\$22.1M	\$3.9M	
1996	\$23.9M	\$5M	
1997*	427M	\$7.9M	

*Projected

Source: International Data Corp. Framingham, Mass.

Open systems data storage

CONTINUED FROM PAGE 39

will be installed at Kredietbank's 745 branches, with capacities ranging from 4G to 48G bytes, according to Carl Tilkin-Franssens, the bank's director.

StorageTek's competition in the open systems arena is significant because the Louisville, Colo., company lets IBM resell its Iceberg mainframe disk storage products.

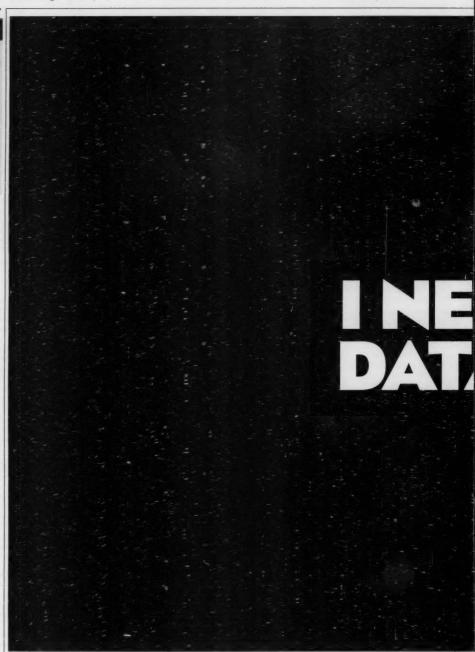
Other plans by vendors to boost their open systems offerings include the following:

■EMC Corp. in Hopkinton, Mass. — the open systems storage market leader — has cranked up the backplane bus speed of its Symmetrix open systems models from 200M to 500M byte/sec. and added new high-density 3.5-in. 9G-byte drives ICW. Ian. 13].

•Amdahl Corp. in Sunnyvale, Calif., is adding the same 3.5-in. drives to its LVS 4500 systems, which will be available in February.

Although IBM's popular 7133 systems, based on Serial Storage Architecture, are aimed at RS/6000 servers, analysts said the rollout of Peripheral Component Interconnect adapters could let the 7133 attach to other midrange Unix servers. And IBM is also trying to resell the 7133 into other server environments.

■Digital Equipment Corp. is shipping the StorageWorks RAID Array 450, which supports Unix, Novell, Inc.'s Net-Ware and Windows NT platforms and can scale to up to 10T bytes of data.



New PC spec is a power play

face of competition from lower-cost network computers, Pucciarelli said. Corporate IS staff, meanwhile, will get systems management features that will let them take a more hands-off approach to PCs which translates into less labor and

time managing their desktops.

ACPI, introduced last year in draft form, will be supported by Intel in its next version of desktop and mobile chip sets and in future processors and OEM system products. Santa Clara, Calif.-

based Intel plans to ship the processors later this year, but the company hasn't provided details about those products.

The specification defines a hardware interface that lets designers put power management features into a PC, including its hardware, operating system and application software.

Microsoft, in Redmond, Wash., plans to integrate the ACPI specification into its Windows operating systems, including Windows NT and future versions of Windows 95.

More than 70 vendors, including Dell Computer Corp. in Austin, Texas; Compaq Computer Corp. in Houston; and Digital Equipment Corp. in Maynard, Mass., have said they will support the ACPI specification.

SMP servers

that boosts performance of traditional symmetrical multiprocessing (SMP) systems by accessing main memory much faster than SMP systems. Companies including Data General Corp. and Sequent Computer Systems, Inc. have used the technique to build highly scalable SMP

Pyramid's new servers, based on its Reliant Unix operating system, are aimed at markets such as online transaction processing, data warehousing and decision-support applications. Users of Nile systems can move up without having to rewrite their applications.

"By dropping the MIPS 10000 into their SMP line, and by combining some of the techniques of NUMA, [Pyramid] has come out with a solid SMP product,' said Rich Partridge, an analyst at D. H. Brown & Associates in Port Chester, N.Y.

BIG BOOSTERS

Major performance boosters on the new servers include a two-level bus architecture with throughput of more than 1G byte/sec., a high-performance I/O subsystem and support for up to 20T bytes of external RAID storage.

One Pyramid user welcomed the announcement but saw little need for the new servers immediately.

"Right now, we have enough horsepower to run our applications," said Edward Hottat, information systems manager at Columbus Lines USA, Inc., a shipping company in Jersey City, N.J. The company runs its shipping management applications on two older RM600 systems that are based on 150-MHz CPUs and support about 12G bytes of

"If we make any enhancements to our application, we might look for the greater capabilities that are offered on the new servers." Hottat said.

The Pyramid servers are "something we are definitely looking at" for data warehousing applications, said Rod Merry, vice president of IS at Damark International, Inc., a direct marketing company in Minneapolis.

We are going to be comparing larger SMP systems and [massively parallel] systems," Merry said. The RM600 server would replace Damark's two older eightway Pyramid servers.

Also significant, from a performance scalability point of view, is that the new servers can be integrated with Pyramid's RM1000 cluster server, making them among the few that combine SMP and massively parallel servers in one cluster, Partridge said.

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internal factors to consider when planning a data warehouse

Internal systems - Using a database you already have may be the fastest and least expensive way to go.

Corporate standards - If a business unit insists on a product that isn't one of your standards, be prepared to invest in middleware.

Nature of the application -Criteria should include projected data growth, number of users, query complexity and required response times

ActiveX middleware

International Software Group, Inc. in Burlington, Mass., last week shipped a version of its ISG Navigator data access middleware that supports Mi-crosoft Corp.'s new ActiveX-based client interface. The support for the ActiveX Data Objects interface lets applica-tions written in Visual Basic, lava, C or C++ link directly to ISG Navigator, eliminating the need for users to go through bridges that implement the Open Database Connectivity specification. The ISG software costs \$5,000 for a server

Oracle aims at Sybase

Trying to hit Sybase, Inc. while It is down, Oracle Corp. is offering trade-in credit of up to 35% off the cost of its software to Sybase customers who make the switch. Informix Software. Inc. announced a similar trade-in deal last fall after Sybase was wracked by financial losses and a manage ment shake-up.

Oracle's program was an-nounced in New York as part of a marketing campaign aimed at financial services companies. The company also said the next release of its financial applications, due in the spring, will have banking-oriented features such as the ability to calculate average

riefs Java gets missing link

Database connectivity enhances business use

By Craig Stedman

JAVA APPLICATIONS are starting to get direct access to databases, a capability that prospective users said is needed to make the Java language more viable for business processing.

The direct Java links that are becoming available from database vendors allow end users to avoid having to go through bridges and other performancethrottling middleware to get at corporate data.

Some of the database links also will run entirely at the serv-



The company will replace some PCs with Java-based network computers

er level, eliminating the need to install database access code on the desktop.

Those kinds of thin-client promises are just what Mc-Kesson Corp. wants to hear, said Charles Nettles, director of technology at the Information Technologies Division of the San Francisco-based pharmaceuticals distributor.

Late this year, McKesson plans to start swapping in Javabased network computers for some of the 5,000 PCs that its pharmacy customers use to place and track orders. Nettles said. McKesson hopes that will

Java, page 44

PROGRAMMING

Microsoft has challengers in C++ market

By Sharon Gaudin

MICROSOFT CORP.'s Visual C++ development tool reigns in the popular C++ arena, but two companies are in hot pursuit.

Sun Microsystems, Inc., Borland International. Inc. and Microsoft are all coming out with new versions of their C++ products. And it is a lucrative market - more than 40% of client/server development is done in C++.

This wave of tools based on C++ is part of the language's evolution into a key standard, according to Judith Hurwitz, president of Hurwitz Group, Inc. in Newton, Mass.

"People are spending a lot more development effort in the C++ arena than they did three years ago," Hurwitz said. "It's continuing on the course of more visualization, more ease of use."

Hurwitz said users are impressed with Borland's C++ Builder, which is expected to ship in early March. Borland's development tool takes the visual aspects of its popular Delphi and attaches it to a C++ tool.

C++Builder is part of Borland's move to bring the firm back into the forefront of the application development industry. Microsoft, page 46

Macintosh faithful tested by Apple plans

By Lisa Picarille

APPLE COMPUTER, INC.'S strategy to support two operating systems has users pondering whether they will continue to embrace the Macintosh plat-

Earlier this month at Macworld Expo in San Francisco, Apple laid out its road map, which includes parallel development of the Mac OS at least through next year and creation of a second operating system by

melding its now-defunct Copland operating system with technology from its \$400 million acquisition. Next Software. Inc.

Apple said it plans to continue to release updates of the Mac OS every six months, as announced at Macworld in August. The Cupertino, Calif., computer maker made good on that promise earlier this month by releasing Mac OS 7.6, codenamed Harmony [CW, Jan. 13].

Apple plans in July to deliver Macintosh, page 44

RHAPSODY ARCHITECTURE

- I Is built on the Power Macintosh and Power-PC platforms
- I Its operating system includes a microkernel. 1/0 architecture and an advanced file system
- I Is compatible with Mac OS
- Has OpenStep-based APIs, which enable preemption, protection and symmetrical multiprocessing

Borland offers solid, powerful C++Builder

By Howard Millman

JUST WHEN YOU THINK it is time to check financially troubled Borland International, Inc. for a pulse, it bounces back with yet another worthwhile product. Its latest release, Borland C++ Builder, provides a powerful, drag-and-drop C++
integrated development

environment.

The product includes a library of more than 100 reusable visual components, plus a set of C++ tools designed for linking to corporate databases via native drivers and Open Database Connectivity. It supports object-oriented features such as encapsulation, polymorphism and multiple inheritance.

Previously code-named Ebony, C++Builder was Borland, page 44



Borland's new C++Builder includes a library of more than 100 reusable visual components and a set of C++ tools designed for linking to corporate databases

REVIEW

Borland C++Builder, beta

Borland International, Inc. Scotts Valley, Calif.

PROS

- Comprehensive Ease of use

· Borland's reputation for not always working out the bugs

lifty: First quarter 1997 Price: Competitive upgrade: \$299.95; Borland C++ Client/ Server Suite: \$1 999

Macintosh faithful tested

CONTINUED FROM PAGE 43

Tempo, which will include the Finder desktop environment natively running on the Power-PC. That will enable users to execute multiple tasks such as launching and copying files simultaneously.

Tempo will update some of the Macintosh user interface to look more three-dimensional, while fully integrating Apple's Cyberdog Internet browser technology.

Tempo also is slated to include the runtime version of Mac OS for Java and a personal Web-sharing feature that will let Macintosh users set up their desktops as Internet servers.

Apple plans to follow up Tempo next January with a Mac OS version called Allegro and subsequently in July with Sonata. Apple officials said they sought to demonstrate a commitment to future development of the Mac OS, though they provided no details of those planned releases.

RHAPSODY IS NEXT

While Apple seeks to update the Mac OS, the company will attempt to squelch criticism that its operating system isn't modern. Apple's answer: Rhapsody, a new operating system that will offer users pre-emptive multitasking, memory protection and symmetrical multiprocessing with technology from Next.

The company plans to execute Rhapsody by coupling Next's OpenStep application programming interfaces with a compatibility box that allows current

Apple Computer reportedly spent more than \$500 million on its now-defunct Copland next-generation operating system.

Macintosh applications to run with little or no modification. Those features will be layered on top of a microkernel, an I/O architecture and an advanced file system, according to Apple officials.

Independent software vendors will get a Rhapsody developer release this spring, but the final version of the operating system isn't due until mid-1908.

Being forced to wait until then does not sit well with users. Bill McCauley, acting data processor manager at the Alaska Legislative Affairs Agency in Juneau, said he is more concerned about the here and now.

"What we need is a system that is easier to use and has fewer problems; and we want that now," said McCauley, whose agency has 250 Macintoshes and 125 PCs.

But even with his impatience for Macintosh improvements, McCauley said his Windowsbased desktops "are even more troublesome."

OTHER OPTIONS

Norman Eide, information systems manager at American Eagle Insurance Co., said he is looking at Windows NT as an option.

Users relying on the Mac OS are stuck waiting, said Eide, whose Sacramento, Calif., company has about 70 Macintoshes and 10 PCs.

"By the time Apple delivers Rhapsody, and it is tried and tested, it will be late 1998," Eide said. Meanwhile, Windows NT is already bulletproof, he said.

"We would have stayed with Apple if they had delivered on their promises," Eide said.

Borland offers C++Builder

CONTINUED FROM PAGE 43

designed to bridge the gap between rapid application development environments, such as Borland's Delphi, and textbased C++ tools. But C++Builder uses the C++ language, whereas Delphi uses Object Pascal. In addition, C++Builder provides high-end features omitted from Delphi, such as a project manager window and low-level debugger.

Support of the Win32 application programming interface, ActiveX and OLE Automation makes C++Builder well-suited for building large-scale applications using Windows and Intel Corp.-based hardware.

Developers familiar with C++ will feel comfortable with C++Builder's syntax and code structure, although its graphical appearance differs from traditional C++ environments. Developers new to C++ get a bonus because the product's graphical interface can help them learn the language quicker than traditional text-based C++ development tools.

The late beta edition I tested seemed stable, intelligent and easy to work with — again proving that Borland knows how to make development products that reflect how developers work.

C++Builder applications start with the familiar Forms window and an Object Inspector that manages the inventory of controls resident in the current form. A double-click opens a window where you enter C++ code for the objects.

Instead of a separate tool box for visual components, C++ Builder uses a tabbed control, called the Component Palette, to group components by functions.

The development environment nicely spans the gulf between text-based C++ environments and visual programming models. For instance, the Project menu facilitates the builds, a Database menu eases connections to back-end data sources, and the Workgroups menu links to the source library management system.

To test the software, I built a gaming application that produces the sum of two dice thrown a specific number of times. Although this is a simple application, developing it went smoothly, and it ran quickly once compiled.

In addition, I converted existing C and Visual Basic applications into the C++Builder format. C++Builder allows developers to leverage their existing C++ applications because it recompiles all ANSI-compatible C++ code. Furthermore, C++ Builder interoperates with existing Borland C++ applications by means of common project file support, a common 32-bit native code compiler and an incremental linker.

Existing components are customizable into C++ classes, and you can build your own visual components.

But for all the similarity between visual development environments, some aspects, such as Grid Controls, act differently.

For example, Microsoft's Visual Basic uses a Grid control that employs a row-and-column property to define the current cell. That enables you to load the text property into the current cell and then "walk" to the next cell by changing the row or column variable, or both. In

The comprehensive C++Builder offers good performance and is easy to use

C++Builder, the Grid has a Cells property based on a two-dimensional array of strings. That allows simpler and more straightforward coding when loading the Grid.

Debugging ·also required some getting used to. The process temporarily got ahead of me until I discovered the "Trace to Next Source Line" command in the menu.

To help understand these and other differences, online help proved valuable. For example, it fully describes each control with property lists, method lists and examples.

Overall, Borland has blended the visual metaphor that Basic programmers have had with the C++ language to make a robust and comprehensive environment. It lets developers quickly build scalable projects by taking advantage of C++'s efficiency and organization.

The C++Builder beta seems stable. But it has to prove that it can overcome Borland's reputation for not always working out all the bugs.

Millman operates the Data System Services Group, a consultancy in Croton, N.Y. You can reach him at hmillman@mcimail.com.

Java gets missing link

CONTINUED FROM PAGE 43

reduce the \$500 monthly tab for supporting and upgrading each PC. he said.

But server-driven direct access to McKesson's Oracle Corp. databases "is certainly one of the primary keys" to making Java workable, Nettles said. Otherwise, the clients wouldn't be as thin as desired, and McKesson would have to

continue maintaining a mix of middleware to connect them to es are folloo the databases.

Vendors are providing direct access to data via drivers that hew to the Java Database Connectivity (JDBC) specification, which Java inventor Sun Microsystems, Inc. released last year. JDBC is a new rival to Microsoft Corp.'s ActiveX-oriented OLE DB data access interface.

Sybase, Inc. in late December started beta-testing software called JdbcConnect with its SQL Server database. The JDBC driver is due to ship this quarter and will support non-Sybase databases when used with Sybase's OmniConnect middleware, the

vendor said.

Informix Software, Inc. said it expects to start limited shipments of a JDBC driver for its databases in March. Oracle also promised a first-quarter beta release of software that translates SQL commands into JDBC calls. A thin-client JDBC driver will follow later in the year, Oracle and the start of the

cle said.

The big three

of Unix databases are following IBM, which included JDBC support in a release of its DB2 software that became available in December. IBM's driver includes code that has to be installed on client machines, a trade-off that IBM officials said was made to get better performance.

The McCarter Theatre in Princeton, N.J., which runs a network for itself and 10 other arts organizations, is testing Sybase's JdbcConnect for use with upcoming Java-based decision-support applications.

"With Java, there hasn't been easy database access up to now, so we've sort of been sitting on the sidelines and waiting," said Alan Levine, director of information services at the theater.

Levine said he wants to go the thin-client route to cut softwere installation and support requirements for the 300 PCs on his network. But direct JDBC links are critical for performance's sake because decision support and external ticket sales run on the same Sybase SQL Server database, he said.

KEEP CUSTOMERS HAPPY

"We don't want our customers waiting on hold to buy tickets any longer than they have to," Levine said. The theater also eventually wants to enable customers to buy tickets via the World Wide Web, which would put even more of a load on the database, he said.

Java-based network computing "would certainly simplify our environment," said Hugh Allan, manager of information technology at Dunlop Tire Co., an Oracle user in Amherst, N.Y. He said a planned upgrade to graphical versions of Oracle's applications was put on hold because it would have required more memory at Dunlop's PCs.

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Candidates for the Flat Earth Society

NCE - JUST ONCE - I'd like to hear someone in this business acknowledge that computer technology doesn't improve productivity.

We've all heard about the studies that show, despite the buckets of money companies have poured into IT since the dawn of desktop computers, how corporate productivity has barely inched up at all.

But we don't believe it. We insist that the studies

are wrong (they aren't), that something else is siphoning away the increased productivity (it isn't), that there's a new "statistically invisible" productivity that justifies our IT investment (there isn't).

This amazing, blind faith has made IT departments the Flat Earth Society of the corporate world. We've seen the pictures from space: we just can't believe it's true.

That flat-Earth faith has also brought plenty of grief down on IS staffers -

from the CIO on down when they don't deliver on their promises of a return from that IT investment. Budget cuts, downsizing, outsourcing and house-cleaning are what happens when that faith goes unful-

Part of the problem is that we're competing with the past. Factory automation made workers hugely more productive earlier this century. We want to believe that we can get the same results with office automation.

But remember what productivity is: the total output divided by the total number of workers. A leather-cutting machine in a shoe factory lets one worker do the work of a dozen human leather cutters. How many typists can a single word processor replace? Probably not more than two. Letters and memos aren't stamped out like mass-produced shoes.

In most cases, they're custom-made. Nor can you lay off 90% of your sales staff by using sales-force automation software or dump most of your accountants by buying spreadsheets. The customized work done by white-collar workers is a tougher nut to crack than factory automation.

We're also hobbled by our love of the technology. Let's face it, this stuff is fun - the best toy box in the world. How could something that much fun not make us more productive?

OK, fun isn't the same as productivity.

But computers make us faster, right? They improve our quality, don't they? They let us do things we couldn't do before - doesn't that boost productivity?

Yes, sometimes. But that simple, cold productivity ratio - output per worker can't be goosed up just by throwing technology at it.

Real productivity improvements come from smart application of the technology. That's where some IS shops have worked wonders, while others have fallen on their faces.

Sometimes the most productive solutions are low-tech: a cheap desk calculator instead of another window on screen, or a Day-Timer instead of a palmtop.

But most often, we just need to stay focused on the problems we're trying to solve with technology. Despite all the noise from vendors, reviewers and pundits who pitch even more of the best toys in the world, we've got to remember the goal: more output per worker, not just more technology.

Otherwise, we'll never be able to figure out where all that productivity went.

Hayes is Computerworld's staff columnist. His E-mail address is frank_hayes@cw.com.

Microsoft has challengers in C++ market

After a financial and mind-share slip, Borland is looking to work its way back with a series of product announcements, said Diane Rogers, Borland's group product manager for Delphi and C++.

Rogers said a new version of Delphi is slated for early in the second quarter, and IBuilder, Borland's Java development Builder, a point-and-click JavaScript tool for World Wide Web applications, was released in December.

SUN'S PRODUCT

On the Sun front, Visual WorkShop for C++ Version 3.0 is shipping for Unix en-

vironments. That version was redesigned to make it faster and easier to use, said Joe Keller, director of marketing and support at Sun's WorkShop product group.

And that redesign is working, according to Han Tunca, a programmer at

and fast," said Tunca, who noted that TradeLink is adopting the tool after betatesting it. "This is really professional. The interface is nice to use. It seems to be logically laid out, and that's not something you always find."

Keller said Version 3.0 of Sun's C++ tool is editor-centric. "The editor used to just be one of the tools. Now it's at the center," he said. "All of the tools will be displayed within the editor, and that will save a lot of time.

Visual WorkShop for C++ also sports a new visualization tool that allows developers to drop in information and a threedimensional display that can be rotated and magnified for a better view

A spokesman for Microsoft declined to say what features Visual C++ will have. It is set to be unveiled at Microsoft's Developers Day March 19.

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TradeLink LLC, a Chicago-based futures and options trader. "It's a really nice tool. It's easy to use

Web help for the help desk

Bendata, Inc. in Colorado Springs last week announced software that lets he desk staffers with no previous Hypertext Markup Language experience build World Wide Web pages so users can process their own trouble tickets over the Internet. Designed to reduce users' calls to the help desk and cut telephone on-hold times, the HeatLink software is available for Windows NT servers.

Sybase aims at message-oriented middleware

Sybase, Inc. is taking another crack at message-oriented middleware after giving up last year on a product that was aimed mainly at mobile users. This time, the Emeryville, Calif., company is developing application-to-application messaging software that will be tied closely to its SQL Server database and an upcoming Web application server code-named Jaguar. The messaging software, code-named ATP (for Asynchronous Transaction Processing), is due to ship in the first half of the year along with Jaguar, Sybase officials said.

Baan becomes year 2000-compliant

Add Baan Co. to the list of year 2000-compliant vendors. The Dutch software company engineered its software starting in the early 1990s with four-digit year numbering. The result is that in four years, any references to the date will read 01/20/2000 instead of 01/20/00. The re-engineered software is included in the Tritan III line of products. Users of Tritan II or earlier who have technical-support contracts will be upgraded for free.

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Briefs

Servers going Bonkers

intel Corp. plans to releas custom network applicable custom network application monitoring software that has been watching intel's own servers for nearly two years. UDP Consulting Services in Beaverton, Ore, is revamping the tool, internally called Bonkers, with a new interface and expanded features. Bonkers continuously checks databases, file servers and TCP/IP network services, all without rerk services, all without re-ring agents on systems ci

UNWIRED

What percent of your workforce uses or will use these wireless mications technologies?

In three years

Collular 53%

Portable PCs with

Base: 100 Fortune 1,000 companies that use wireless technology

CA-Unicenter picked

rox Corp. and outsources actronic Data Systems Corp. have picked one tool kit to manage more than 1,700 servthat support 70,000 wor

The companies last week mounced they chose Ver-on 2.0 of CA-Unicenter, due ut this month from Comp Associates Internation c. in Islandia, N.Y. EDS already is deploying the soft-ware distribution portion of the systems management rite, sald Joe Grant, vice resident of global technol-gy, strategy and infrastruco at Xorox in Stamford

get a shot in the arm

By Kim Girard

FIREARMS DEALERS in California are going paperless with an automated system that ships buyer registration information to the state's Department of Justice for criminal cross-checks.

In California, a handgun or rifle owner must register the weapon through a licensed gun

Dealers throughout the state currently send sales information - called a record of sale to the state's Justice Department through postal mail, a process that can take up to 20 days.

But a new automated front end system provided by MCI Communications Corp. that links dealers to the Justice Department is expected to knock days off the approval process, enabling the department to complete it within a newly mandated 10-day waiting period on all firearms sales.

Gun deals, page 51

HOW THE SYSTEM WORKS



A dealer's record of sale, which includes information about the applicant, is forwarded via modem or voice line to an attendant or is sent directly to the MCI



MCI validates the dealer's license to sell firearms and the applicant's information, which includes name, address and 58 other pieces of data.



The California Department of Justice cross-checks the information against databases that track out-

standing warrants, criminal records and department of motor of Justice issues a ruling on the application, which is sent back to the dealer.

Gun dealers Web tools show seamy side

▶ Users stumble on hidden costs, requirements

By Patrick Dryden

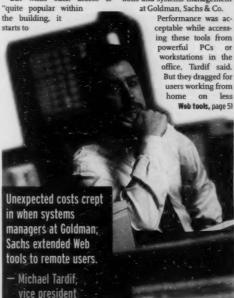
EARLY USERS of Web-enabled management software are reporting some general problems caused by the otherwise beneficial access enhancement to their regular tools

Specifically, users said they had uncovered some hidden costs, surprise requirements and potential embarrassments.

Reaching across the World Wide Web or a corporate intranet to maintain systems and networks demands bandwidth and performance beyond everyday browsing. And sensitive information may be revealed for the first time inside and outside the organization.

But information systems managers have shrugged off these issues as growing pains to endure while vital tools catch up with Internet advances. They are glad support staffers no longer have to vie for a few central consoles or distribute management information throughout the organization. Through browsers, technicians can work anywhere on the network or remotely, and savvy users can check availability and answer many questions themselves.

try to get in from home," said Michael Tardif, vice president of enterprise technology for operations and systems management But while such access is



Disk fragmentation hounds power NT users advantages in

By Laura Di Dio

DISK FRAGMENTATION, an old problem dating back to the early days of MS-DOS, is back again. This time, it is plaguing Windows NT users who as sumed they were immune to the problem because of the advanced NT File System (NTFS).

Disk fragmentation is a condition in which files are broken up and scattered into pieces on the hard disk. The degree of disk fragmentation increases with the number and size of the files stored on the hard disk, said Jonathan Eunice, an analyst at Illuminata, Inc., a consulting firm in Nashua, N.H. Hard disks that have significant fragmentation - 50% or higher -



Disk fragmentation made the university's Windows NT machines "horribly slow"

are likely to degrade overall system performance and in a worst-case scenario, crash the system.

'Fragmentation is an unavoidable problem associated with storing data on your hard NT users, page 52

DATA MINING Utilities find automation

By Mindy Blodgett

THE DAYS WHEN utilities basked in their monopolies and counted on customers have been replaced by a deregulated world where utilities compete fiercely for business.

That calls for sales and marketing techniques, such as using sales force automation software, that can mine customer data for opportunities.

Boston Edison Co. took that route a year ago when the electric company began using sales force automation software from CallBack Software, Inc. in Burlington. Mass., to keep better track of corporate customers

Advantages, page 51

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All Windows World Open Finalists will demonstrate their solutions in the contest booth at Windows World / COMDEX Spring in Atlanta, Download year entry kit today!

June 2-5, 1997. Final judging takes place on site and winners are announced by Microsoft CEO Bill Gates at a special awards ceremony following his keynote presentation at Windows World / COMDEX.

Don't miss this opportunity to show the world your custom Windows-based solution. Submit your entry by February 10, 1997 and receive the recognition you deserve! Call 800-829-4143 or 206-443-3329 today or email wwopen@jcai.com for more information.

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NEW PRODUCTS

NETSPEAK CORP. has announced a new version of WebPhone, a telephony software client for encrypted, point-to-point voice and data communications over LANs and WANs, including the Internet.

According to the Boca-Raton, Fla., company, WebPhone 3.0, introduces real-time video communications, firewall proxy support and 32-bit system operation.

A Pentium-based PC with at least a 28.8K bit/sec. modern is recommended for high-quality reception.

WebPhone 3.0 costs \$49.95. NetSpeak (561) 997-4001 www.netspeak.com

DOCUMENT CONTROL SYSTEMS, INC. has announced Message Server, an enhancement to MasterControl's document routing and approval module.

According to the Salt Lake City company, the product lets companies route documents electronically for review and approval using normal company electronic mail.

Prior to Message Server, MasterControl could send and receive messages only through a limited number of E-mail systems using the MasterControl E-mail gateway.

Message Server costs \$1,499.

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(800) 825-9117

REAL TIME INTEGRATION, INC. has announced NetAcquire 3000, a network data acquisition server that acquires, processes and updates real-time analog data at more than 750,000 samples per second.

According to officials at the Redmond, Wash., company, the product uses a standard Ethernet network to communicate with a client computer that monitors and displays the results.

NetAcquire 3000 is priced at \$8,495.

Real Time Integration (206) 883-7563 www.realtimeint.com

Advantages in sales automation

CONTINUED FROM PAGE 49

and opportunities.

Rather than shuffling paper files, sales representatives now keep records on their laptops, said Brian Vickery, implementation manager at Boston Edison. The move means the 30-strong sales force spends more time with customers — about 50% of its workweek rather than the 20% of a few years ago, he said.

"If you can spend more time in front of customers talking about deals, that leads to more sales," Vickery explained. "It was one of our goals to increase that time, and automating the sales force aided in that."

SUPERB SOFTWARE

Boston Edison's interest in the CallBack software stemmed from its use of Sybase, Inc.'s SQL Anywhere, a database manager for remote and mobile communications.

Vickery said he liked the speed of the software and its locking capability, which prevents users from accidentally deleting important data.

SQL ANYWHERE

The Sybase SQL Anywhere database software, which is part of CallBack sales force automation software program, supports the following:

- ► Remote sites through database replication in PC- and LAN-based organizations
- ►Windows 95 and Windows
- ► Desktop integration capabilities such as Dynamic Data Exchange and Dynamic Link Library

The utility spent about \$500,000 on the implementation. That included software and consulting.

Brian Balcom, an account executive at Boston Edison, said the automation boosted his productivity. "When we had paper files, I would have to take the time to search through the paper for each customer." he said. "Now I can handle 10 phone calls from customers or several queries in a much shorter period of time."

Yet Balcom said moving into automation was a difficult transition for some users. "The Franklin planner used to be the Bible here," he said, referring to the popular time-management system. "But it's hard to share information from a paper planner with another sales rep. Now we have a database that everyone can have access to."

Judith Hodges, an analyst at International Data Corp. in Framingham, Mass., said a recent survey of sales force automation vendors shows they are focusing particularly on utilities as a fertile vertical industry for potential customers.

"Because it is the kind of industry that has to manage so many different items at once, like billing, energy needs, etc., they are prime for such software as distribution management products and other sales force products," Hodges said.

Web tools' seamy side

CONTINUED FROM PAGE 49

capable PCs and from a remote site over a modem instead of the company network.

Graphics display and performance aren't as good on a browser as they are at a console dedicated to displaying management data, and operators must remember to hit reload to see the latest information, said Jeff Leggett, webmaster and network services manager at Mitsubishi Consumer Electronics America in Norcross. Ga.

TAKING RESPONSIBILITY

Supporting Web-enabled management tools adds a new load to an IS group because "now someone has to be responsible for a Web site," said Steve Tindall, technical specialist at Allegiance Healthcare Corp. in McGaw Park, Ill.

"That's something we took on without a lot of expertise, and it required a heck of a learning curve," Tindall said.

For Tindall and other administrators, opening up management information raises security concerns that demand attention.

"Someone inside the company might change program parameters so we lose a week's worth of valuable performance data before we know it." Tindall said. "Externally, we don't want to reveal the IP addresses of our routers." So administrators must remember to assign access privileges, if possible, and update firewall software.

CLOSE WATCH

After security is ship-shape, though, some IS managers find they can't fudge on their responsibilities.

That's because superiors and watchdogs within the organization can easily monitor network availability, systems performance and overall service provided to end users.

For example, anyone within the 335-store chain of Long's Drug Stores of California, Inc. can call headquarters in Walnut Creek, Calif., to complain about slow response in processing insurance claims or clearing checks there.

These days, however, "technologically savvy executives" can pop up reports at their desks to check the chain's network performance, said Dave Klinzman, director of network services at Long's Drug Stores.

"Web-based reports put us under the gun," Klinzman said. "Now we have to be as available and responsive as the phone company."

Gun deals get shot in arm

CONTINUED FROM PAGE 49

When the new law takes effect April 1, 40% of the state's 1,000 firearms dealers will be connected to Pentium computers lent by MCI.

The computers operate on Windows 95 and have 60M bytes of memory.

Using 28.8K bit/sec. modems, dealers will send records of sale directly to MCI. About 600 smaller dealers will use toll-free telephone numbers to call in information to MCI attendants.

"As a dealer who has to deal with a lot of paperwork, I find this to be a very strong move forward," said Bob Posner, coowner of the San Francisco Gun Exchange. Posner said he worked with the group that is changing the state's system and will get a computer from MCI. "I think it's going to expedite our processing and make things a lot easier on the dealer, the state and the consumer," he said.

Using the new system, MCI will track purchases and bill dealers monthly for processing fees owed to the Justice Department, eliminating the need for dealers to send daily checks through the mail.

Overall, the industry trend is toward more public/private alliances that make public institutions run more efficiently, said Mike Humphrey, business director of telecommunications at Public Technology, Inc. in Washington.

"As a dealer who has to deal with a lot of paperwork, I find this to be a very strong move forward."

- Bob Posner, co-owner, San Francisco Gun Exchange

"A lot of local and state governments desperately want to get away from the paper," Humphrey said. But, he added, "It's very difficult to re-engineer systems and get away from that. Insurance companies are the best example of this."

MCI won the project bid because the company's system could beat timing requirements of the new law and had the required database technology, said Mike Broderick, firearms program manager at the Justice Department in Sacramento.

Through the contract, the department will pay MCI \$2.63 for each dealer transaction, or about \$920,000 per year, to assist with about 400,000 firearm sales.

"Savings will be a wash, but we'll be able to meet a 10-day turnaround time," Broderick said.

MCI's new system crosschecks the accuracy of 60 items on the dealer's application, which includes the applicant's name, address, height, weight, driver's license number and other background details.

After MCI's process, a Justice Department fact-checking analyst enters an identification number or name into the department's Consolidated Firearms Information System, which brings up outstanding federal warrants as well as criminal and motor vehicle history.

By merging three separate databases last year, the Justice Department reduced its record-checking staff from 100 to 40 people and cut 50% of all background checks to 48 hours.

MICROSTAR LABORATORIES. INC. has announced DAPcell software for distributed intelligent data acquisition and process control applications on industrial networks.

According to the Bellevue, Wash., company, a user may control a DAPcell from any Windows NT or Windows 95 PC on the network. The price is \$995 for the first license on a network; each additional license costs \$495.

Microstar Laboratories (206) 453-2345

GANDALF TECHNOLOGIES, INC. has announced the PBX Extender Pack for its Xpress Connect 52321.

According to the Nepean, Ontario, company, the PBX Extender Pack provides remote users with single-device, two-way access to their corporate private branch exchange

The price is \$695. **Gandalf Technologies** (613) 274-6500 www.gandalf.com

ASCEND COMMUNICATIONS, INC. has announced the MultiDSL family of products, including IDSL for high-speed Integrated Services Digital Network Internet and remote-office access to enterprise networks. According to the Alameda, Calif., firm, IDSL is a \$3,000 eight-port line card for the MAX 4002 and 4004 multiprotocol WAN access switches.

Ascend Communications (510) 769-6001 www.ascend.com

Switching war helps Ethernet users

WAR ISN'T REALLY HELL if you are an IS manager looking to score some Ethernet switches. Price wars are sending the cost of Ethernet ports spiraling down like a flaming fighter plane

A LAN switching market jammed with vendors, combined with widespread demand among users who want more bandwidth than they get with shared Ethernet connections, is driving down the price per port of desktop and workgroup Ethernet switches from the \$300 to \$400 range six months ago to about

And that's only the list price. Some users said they have been able to get discounts of up to 40% by wheeling and dealing with resellers and through bulk contracts with individual vendors.

COST SAVINGS

Rather than force all the members in a workgroup to share a single 10M bit/sec. connection, the switches provide 10M bit/sec. speed to each user. They also typically come with at least one 100M bit/sec. Fast Ethernet port that provides a fat pipe to high-speed servers.

'With these latest prices, we're finally at a point where 10M bits to the desktop is not only a very viable technology op tion, it's a cost-effective one, too," said Maralyn Rosenblatt, vice president of client services/desktop technologies at Countrywide Home Loans in Simi Valley. Calif. "It'll enable users to more easily and quickly upload research materials and download files from the Internet, deploy higher-quality videoconferencing to the desktop, edit [computer-aided design] drawings and transfer complex file types.

Analysts said they anticipate that the war will be protracted.

"You can expect the cost of Ethernet switches to drop below that of [regular] Ethernet hubs this year," said Eric Hindin, an analyst at The Yankee Group, a Boston consulting and research company.

"And expect to see prices drop further as other companies scramble to stay competitive," Hindin said. Bay Networks, Inc. last

week joined the price war with the debut of the 2216T, a 16-port Ethernet switch priced at roughly \$133 per port.

A similar product from 3Com Corp. weighs in at \$120 per port, followed by Lantronix Systems, Inc.'s switch at \$124 per port.

Arizona State University in Tempe is one of an army of users starting to take advantage of Ethernet switching, in part because of plummeting prices.

Joe Askins, director of data communications at the 150-building university, said the school is beginning to deploy

Ethernet switches to relieve heavily used segments of an Ethernet network that supports some 17,500

Askins uses LAN monitoring software from Concord Communications, Inc. in Marlboro, Mass., to measure traffic on every seg-

"If segment usage is above 15% of capacity, we'll give users switched Ethernet [links] to the desktop,' Askins said. "We also look

at what machines users have on their desks, what new applications they want to use and which servers they need access to."

Just two weeks ago, fast-food giant McDonald's Corp. in Oakbrook Terrace, Ill., said it has deployed more than 3,000 switched Ethernet links to desktops and sees a bright future for the LAN switching technology throughout the company.



Raging price war pleases Arizona State's Joe Askins

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warehouse accessible from local and remotely-connected PCs.

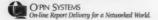
And our PinPoint™ page-level viewing and printing security is enforced for every user.



REVEAL benefits:

ACTIONABLE	SCALABLE	FLEXIBLE	RELIABLE	USABLE
Desktop tools search, extract, analyze, annotate and export.	Intranet and client/server optimized architecture.	On/off-line report viewing from PCs, Browsers, Lotus Notes.	REVEAL technology is market-proven.	Turnkey, easy-to-install easy-to-learn, automatic updating.

Available Today. REVEAL can go online immediately in your organization.



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users hit fragmentation snag

OPERATING

SYSTEMS

drive; it's an ongoing issue for Windows users. The more files you have and the more diversity you have in the size of the files, the greater the chance of disk fragmentation, wasted space and burned performance," Eunice said.

Even sophisticated Microsoft Corp. Windows NT power users

are often caught unaware. Many have no idea they have a fragmentation problem until the system performance is

severely degraded or the system crashes. And currently there is only one third-

party utility - Diskeeper from Executive Software, Inc. in Glendale, Calif. - that can "defrag" the hard disk.

HARD LESSONS

Also, many users mistakenly believe the robust NTFS, which replaced the File Allocation Table (FAT) system used in other Windows versions, makes the Windows NT operating system immune to hard disk fragmentation.

Several unsuspecting Windows NT power users have found out the hard way about what happens when their hard disks are highly fragmented.

Ed Young, network manager at Utah State University's Research Foundation in Logan, said performance on his Windows NT machines was horribly slow. "It took 15 minutes to load a single graphical design drawing. Later, we found that the performance degradation was caused by our 70% disk fragmentation," he said.

Users such as Young have two options

when they suspect their hard disks have become highly fragmented. They can elect to do a complete backup and restore of the disk, which is time-consuming and impractical on a regular basis, or they can use a disk defragmenter, which rearranges files on a disk so they are as con-

tiguous as possible. Symantec Corp. in Cupertino, Calif., also will re-

lease a new defragmentation utility, Speed Disk for Windows NT 4.0, that supports NTFS and FAT files.

A Microsoft spokesman said the company won't provide its own defragmentation utility for the Windows NT platform until after Version 5.0 ships.

Young used Executive Software's Diskeeper to solve his fragmentation problems.

"Once we installed Diskeeper, we were able to launch applications, access data and download our graphics in a fraction of the time - three minutes instead of 15 minutes," Young said.

"And we don't even know Diskeeper is on the network," Young said.

Other users had similar experiences. Rod Samuel, a senior engineer at Lockheed Martin Tactical Aircraft Systems in Fort Worth, Texas, said "We can't afford downtime - at all."

Like Young, Samuel said he was dismayed to find his systems had 70% fragmentation. "Performance noticeably improved and access times increased dramatically when we installed Diskeeper." he said.

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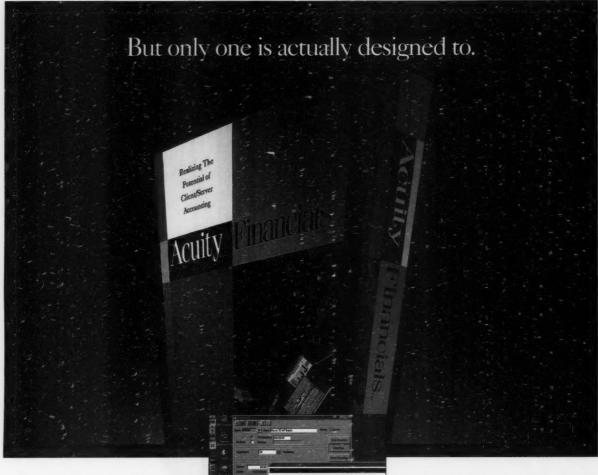


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The Internet

The World Wide Web + Intranets + Online Services

Flickering bandwidth

bandwidth-hogging dis-on on the Internet this k when the American Film Institute begins providing Hol-lywood classics via the World ide Wab. AFI Online Cinema debuts Wednesday with a 1916 Charlie Chaplin film at

Internet babysitting
Here comes another too Corp. in Boston is beta-testing software that can block access to Web sites or newsgro track time online. Equitrac's eduled to ship in February or March. It will cost \$99.

Boosting bandwidth

Internet service provider UUnet Technologies, Inc. plans to boost performance by buying high-and networking gear from Ascend Communications. Inc. UUnet will install 150 of Ascend's flagship Mex TNT wide-area network access switches. Each switch can suport 627 simultaneous data alls over a 45M bit/sec. line.

TODAY'S INTRANET APPLICATIONS



- **Publishing internal** information
- Line-of-business applications
- Collaboration
- Links to partners
- Links to customers
- Electronic commerce

Base: 600 IS professionals

riefs IS tries to keep insanity out of intranets

they want their

own server."

- Diane Silver,

American

President Lines

By Justin Hibbard

A LITTLE WEB knowledge is a dangerous thing. Just ask information systems managers at companies where end users manage their own intranet sites.

Those managers are learning that they must strike a balance between letting users publish freely and imposing standards that keep the network from becoming a jungle. Most companies get by with a loose set of publishing policies, but some aren't ready to give users the keys to their own World Wide Web servers.

Diane Silver, vice president of information strategies at American President Lines in Oakland, Calif., said her company has avoided intranet chaos so far by

"Everyone thinks

setting light restrictions.

"We wanted to put together standards [for publishing| that weren't going to constrain use of the intranet."

All changes to the intranet at American President Lines require the approval of a content

owner - usually an IS administrator assigned to a particular department or office. Approved content is then sent to a central administrator, who tests the files on a staging server before forwarding them to a remote service provider that hosts the

company's content on its servers.

Silver supports decentralized content authoring, but she has resisted efforts to decentralize hosting because she fears the disorder that might ensue.

"Everyone thinks they want their own server," she said. 'We're not doing that."

Users at B.C. Hydro in Van-

couver British Columbia also wanted their own intranet servers, but the IS department beat them to the punch.

"We realized that anarchy would happen unless we were proactive in putting together a service," said Steve Whan, B.C. Hydro's corporate webmaster.

CENTRAL HOSTING

Whan's department now offers a central hosting service for departments. So far, the service has been a hit. Users are free from the work of administering a server, and IS maintains control of the network.

But posting pages to B.C. Hydro's intranet server is hardly a one-button operation. Users must first submit the content

Intranet, page 58

GROUPWARE

Outlook client short on Internet ties

By Barb Cole

USERS OF Microsoft Corp.'s Exchange who plan to move to the new Outlook E-mail and groupware client will see small improvements in Internet support. They will have to wait for future releases of Exchange and the company's Internet Explorer Web browser for tight integration with the 'net.

Outlook, Microsoft's nextgeneration client for Exchange, includes calendaring and scheduling. It also lets users embed links to World Wide Web sites inside those schedules to help them point colleagues to specific sites or information when they are scheduling meetings.

Outlook users, like users of the Exchange client, will be able to swap electronic mail with Internet messaging systems that use an Exchange server-based gateway. Outlook also lets users store a folder of favorite Web sites, similar to bookmarks. But Outlook users will have to wait Outlook, page 58

HTML tools finally get serious

New versions add editing features that webmasters need

By Mitch Wagner

AFTER YEARS of pooh-poohing graphical HTML editors as training wheels for beginners, developers are starting to put the tools to work as serious instruments for electronic commerce.

Hypertext Markup Language (HTML) editors offer speed and ease of use to help users get World Wide Web pages out quickly. But they don't do it all; users still say they need to write code by hand to take advantage of the latest Web functionality.

New tools, however, are more able to deliver WYSIWYG functionality while also allowing users to crack open the hood and make changes to the HTML code.

Tools previously fell into two classes: WYSIWYG tools that wouldn't give you an easy way to manipulate the code directly, and tools that used forms to generate HTML code but wouldn't give developers a graceful way to see what Web pages under construction would look like on the Internet.





Tools such as Adobe's PageMill help to automate the process of creating the HTML code for Web pages

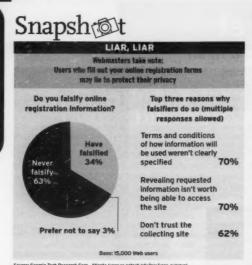
The tools, which generally cost less than \$200, were designed to streamline the process of developing Web pages using HTML, the language that tells Web browsers such

details as where to place text on screen, how big to make the letters and where to draw graphics.

The tools provide a vital shortcut to Web page creation. HTML tags are easy to understand but sometimes difficult to memorize. And the maze of angle brackets and pound signs is often difficult to navigate. HTML editors were designed to speed up the process by automatically generating the right HTML code based on user instructions.

"A WYSIWYG format is nice. You can work with things like tables and graphics," said Christine Eu-

banks, publishing specialist at Chevron Information Technology Co., the information systems arm of the petroleum giant. "If you do HTML code by hand and you're working on a HTML tools, page 58



Outlook lacks 'net features

until later this year for Hypertext Markup Language (HTML) support, which will let them embed Web pages in messages.

"Outlook is a bit nicer than the Exchange client [in terms of Internet hooks], but the improvements are mostly cosmetic," said Erik Iversen, director of application development services at Nabisco, Inc. in Parsippany, N.J. The company will install Outlook on the desktops of 8,000 Exchange users.

Information systems managers at several of the early adopters of Exchange, including Nabisco, the Kentucky Department of Education and Texaco, Inc., said they plan to move to Outlook for its groupware hooks and integration with Microsoft's Office 97 suite.

Outlook shipped last week with Office 97 and will be bundled with Exchange 5.0 later this quarter. It will also be sold separately starting next month.

Greg Scott, IS manager at Oregon State University's College of Business in Corvallis, said the 2,500 students who use Outlook to access Exchange are able to schedule appointments via the Internet. Although that was possible with the Exchange client, users had to add extra files to their PCs because the Exchange scheduling piece was separate from the E-mail component. With Outlook, scheduling is integrated, Scott said.

Companies looking to tie their Exchange messaging servers to the Internet will rely most heavily on forthcoming serverside enhancements, Iversen said. Those include support for Lightweight Directory Access Protocol for building a Webaccessible directory, and compatibility with Network News Transport Protocol for integrating Exchange discussions with Web chats.

Down the road, Microsoft is expected to expose many of the best features in Outlook as ActiveX controls that can be layered atop Internet Explorer. That would enable users to participate in groupware applications from their Web browsers.

OUTLOOK'S 'NET HOOKS

- Lets users embed hyperlinks in schedules and E-mail messages
- Stores favorite Web sites in a folder
- Will support HTML in a later version, letting users embed Web pages in E-mail

Microsoft declined to comment on the plan, but several Exchange sites said the company has promised to do so this year. That would put Microsoft on more equal footing with Lotus Development Corp., which has announced plans to roll out Java applets that render Notes client features in Web browsers.

HTML tools

CONTINUED FROM PAGE 57

table, you can have one little code out of place and — especially if it's an elaborate table — it's difficult to figure out where you went wrong."

Chevron is beginning to use Microsoft Corp.'s FrontPage development tool. It also uses Sausage Software's HotDog.

The latest version of Front-Page lets users edit with a WYSIWYG view or change HTML code by hand when needed. Previous versions delivered the WYSIWYG view but made it difficult to manually change code.

That is important, users said, because HTML standards change so rapidly that vendors can't keep up. That forces users to write code that takes advantage of advanced features such as cascading style sheets, embedded ActiveX controls and properly run Java applets.

LAGGARDS

"They're always a generation behind the HTML we're supporting," said Patrick Naughton, senior vice president of technology at Starwave Corp. in Bellevue, Wash., which produces the ESPNet SportsZone and Mr. Showbiz Web sites.

Moreover, the WYSIWYG view is just an approximation because different browsers will interpret code in slightly different ways. That forces webmasters to tweak the code to make it look best in their favorite browsers.

It isn't just the technology that has changed; users have changed, too. Development frequently falls into the hands of business managers who don't have technical backgrounds and need the ease of use of graphical HTML editors.

HTML EDITORS					
Vendor	Product	Price			
Microsoft Redmond, Wash.	FrontPage	\$149			
Adobe Systems San Jose, Calif.	PageMill	\$99			
Miracle Software Potsdam, N.Y.	WebWeaver	\$89			
Sausage Software Doncaster, Australia	HotDog Professional	\$99.95			
SoftQuad Toronto	HotMetal Pro	\$159			

At TicketMaster Group, Inc. in West Hollywood, Calif., designers use WebWeaver, a Macintosh-based HTML editor. "Their skill set is in art or graphic design," said Bob Perkins, vice president of online services. That gives them plenty of familiarity with graphical design tools but little experience with text-based programming languages.

And even technical users who have to work quickly need tools that are easy to use.

"I do understand the technology, and I don't have the time to do all my coding by hand," said

Adam Karp, online producer at Century 21 Real Estate Corp. in Parsippany, N.J.

Many advanced sites aren't producing much HTML written manually. To keep data up to date, many sites store information in a database and then put a button on their pages that can automatically generate queries.

"We don't use HTML editors much, currently," said Bill Rollinson, vice president of marketing at Internet Shopping Network in Palo Alto, Calif. "A lot of our stuff is generated on the fly, by scripts."

Managing the site

Graphical HTML editing tools are the most junior members in a family of product types designed to help automate the creative processes of building a Web site.

HTML editors let users create only one page at a time. More sophisticated tools range from those that manage the relationship among several pages to those that include project management features designed to support large sites with many programmers.

One step above HTML editors in sophistication is a set of tools to manage the relationships among the individual Web pages that make up a site. Some HTML editors, such as FrontPage, include that functionality. Other times, users must go to a specialized tool, such as NetObject. Inc.'s Fusion.

Really big sites require teams of designers and a tool such as Wallop Software, Inc.'s Build-IT or Vignette Corp.'s StoryBuilder and StoryServer to manage version control and coordinate the work of multiple users. And Microsoft is beta-testing a competing collaboration product, Visual InterDev. — Mitch Wagner

Intranet

CONTINUED FROM PAGE 57

to their department manager. Then IS managers and Whan review it. Users then upload the content to a testing server. Finally, Whan loads the files on a staging server, and custom-written scripts automatically load the content on the live server.

That process would keep the IS department at The Boeing Co. busy all day, according to Joe Meadows, Web proxy service product manager at the Seattle company. Boeing will have nearly 200,000 employees if its pro-

posed merger with McDonnell Douglas Corp. goes through, so administering every department's intranet server would be a huge task.

Boeing's IS department has ceded control of Web servers, but it still oversees content development as much as possible. The IS staff wants to make sure that pages display in all browsers and that multimedia content doesn't suck up too much bandwidth. But the department is careful not to discourage users from developing content.

Rather, the department lets users download a kit that includes the National Center for Supercomputing Applications'

Web server and a few tools for setting up an intranet site. Meadows estimates about 300 servers are dishing out pages on Boeing's intranet.

"We don't want to be enforcing a strict look and feel because there's just too much room for creativity here," Meadows said.

Decentralized hosting also lets users be creative, according to Richard Andersen, manager in the entrepreneurial consulting practice at Ernst & Young in San Jose, Calif.

"It's all about managing change and still leaving room for individual choice," Andersen said.



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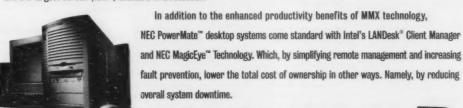
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mainframe VMS environment to client/server. A special Integrator keynote has been added to the program this year, featuring John Singel, National Internet Technology Domain Leader of Price Warehouse. The closing keynote is provided by Naomi Seligman, Senior Partner of the Research Board, who covers some of the data collected by her exclusive organization.

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Moderated by: Alan Paller Director, Research and Education **Data Warehousing Institute**

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- · what kind of infrastructure is necessary to support the amount of data that will be stored and processed?
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- multidimensional database? · what set of tools will most appropriately support end-user
- needs? what are the real capabilities, the relative costs and the return?
- · search engine, text retrieval engine and sort processing

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Moderated by: Gay Slesinger Vice President Giga Information Group

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NEW PRODUCTS

DYNALAB, INC. has announced GlobalSurf, a multilingual communications tool for Internet users.

According to the Santa Clara, Calif., company, the software lets users explore the Internet in 23 languages. It is being distributed electronically in the U.S. by CyberSource Corp.

GlobalSurf costs \$99.

DynaLab (408) 490-4224 www.dynalab.com

FLAT CONNECTIONS has announced Sumba, the first in a series of Flatware products to enhance the speed and security of Web-based communications.

According to the Fremont, Calif., company, Sumba provides a personal firewall that delivers encryption, highly secure electronic mail and real-time virus checking for Internet communications. It includes Java processor-based software that splits the security and antivirus processing tasks between the PC's CPU and the lava coprocessor.

Sumba costs \$349.
Flat Connections
(510) 249-9777
www.flatconnect.com

CLARITY SOFTWARE, INC. has announced MagicFax, software for the Web that sends faxes anywhere in the world for free.

According to the Mountain View, Calif., company, MagicFax routes a fax to the MagicFax Web Server that is closest to the recipient to avoid long-distance charges

The software can be downloaded for free at www.magicfax.com.

Clarity Software (415) 964-4683 www.magicfax.com

TYMPANI DEVELOPMENT, INC. has announced NetAttache Enterprise Solution, a Windows NT-based software package to simplify the gathering and dissemination of Web data over corporate intranets.

According to the Sunnyvale, Calif., company, the system allows organizations to easily update needed data from frequently visited Web sites.

The product costs \$750 for 10 seats.

Tympani Development

Tympani Developmi (408) 735-9555 www.tympani.com

AMZI, INC. has announced WebLS 2.0, a tool for embedding rules-based expertise in Web pages.

According to the Stow, Mass., company, WebLS 2.0 includes a class of application known as the product or service adviser. The applications gather information from the user through Web pages and then make product or service recommendations such as for a new car or career opportunity.

A freeware version is available at www.amzi.com

Amzi (508) 897-7332 www.amzi.com INTERSE CORP. has announced Interse Market Focus 3.0, a new version of the software for integrating, managing and examining Internet user behavior data.

According to the Sunnyvale, Calif., company, new features include a Metadar module for comparing site usage data with other data to provide a comprehensive visitor profile.

Developers' editions start at \$3,495 for the Microsoft Corp. Access-compatible edition.

Interse (408) 732-0932 www.interse.com

SARATOGA SYSTEMS, INC. has introduced SPS WebPort, a World Wide Web interface capability for the company's SPS, a sales automation system.

According to the Campbell, Calif., company, SPS WebPort links the corporate sales process with the Web. Hypertext Markup Language-based online forms can be customized with color, logos and other graphics.

SPS WebPort costs \$4,900 as an addon module.

Saratoga Systems (408) 371-9330 www.saratogasystems.com

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Mar. 31	Solutions Series: Year 2000: Organizational Issues (part 1 of 2)	Feb. 14	Mar. 7
Apr. 21	White Paper: Data Mining Leverages Warehouse Info	Mar. 7	Mar. 28
May 5	Supplement: Electronic Software Distribution Distribution at Networld + Interop	Mar. 21	Арг. 11
May 12	White Paper: Evolution of Systems Management Distribution at DB/EXPO	Mar. 28	Арг. 18

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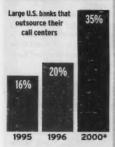




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IT spending rises

The need to stay competitive drove up information technology spending from \$213 billion in 1995 to \$238 billion in 1996, according to market research firm Dataquest in San Jose,

Utility sets up on Web

Carolina Power & Light has selected NexGen SI in Irvine, Calif., to give its employees in tranet access to the Raleigh. N.C.-based utility's human resources and financial information. Under a project called PeopleNet, NexGen will connect the utility's 100 locations in North Carolina and South Carolina through a set of client/server-based le Web objects to the utility's PeopleSoft Corp. human resources applications.

ADP/AIM deal

Automatic Data Processing, inc. (ADP) in Roseland, N.J., has formed a marketing alliance with Advanced Information Management, Inc. (AIM) in Santa Barbara, Calif. AIM's career planning software, HR Horizons, will be combined with ADP's human resources management system, CSS HRizon. HR Horizons' features, such as succession inning, career development, skills and competency management, will be meshed with CSS HRizon's human resources planning capabilities.

Corporate Strategies

Case Studies + Trends + Outsourcing

Briefs They'll do anything to lure tech talent

AMY NAPLES was browsing around a Barnes & Noble book-

ton, N.J., when noticed a

knot of young men flipping through Java and C++ books in the computer section.

Naples did what any good technical recruiter would do. She passed out plenty of business cards and chatted up open software developer positions at her employer, Bluestone Software. Inc. in Mount Laurel, N.I.

"It's just become part of my life. There isn't a technical person I meet who I don't ask

high-level technical person looking for a job," Naples said. "I've even taken to putting my cards

Naples SCHEMES alone. In today's

excruciatingly tight information systems job market, recruiters will do just about anything to drum up prospects and ulti-mately reel in technical talent.

GIVE 'EM THE WORLD

It isn't at all uncommon for headhunters and company recruiters to offer prospects everything from free lunches to signing bonuses of \$10,000 and

Tribune Co. trains 'net pros in-house



By Julia King

WITH NO END in sight to the IS skills crunch, some companies are finding new ways around it.

One is The Tribune Co., where finding technically savvy Internet developers with keen

"We have lots and lots of creative people. The key is getting them comfortable working in this medium."

creative skills has been one of the biggest problems.

The Chicago-based publishing and broadcasting company has stopped looking for information systems skills solely in the open market.

Instead, it is training its staff of print artists and page designers in Hypertext Markup Language (HTML) and other Internet skills.

'Rather than take the approach of looking for a few qualified people to get projects done, everybody in the company has

to be able to have some competency in electronic publishing,' said Jeff Scherb, senior vice president and chief technology officer at the company.

In the past two months, Tribune staffers from various departments have published more than 100 pages on the company's TribTech World Wide Web site. The in-house site showcases employees' electronic publishing projects and gives workers a place to practice their HTML skills.

It also is used as an intranet for Tribune employees to share information about Web-based projects at the company.

cipients.

CLIENT/SERVER SHIFT

Maine drives Medicaid reform with decision-support system

By Thomas Hoffman

THE STATE OF MAINE is throwing information technology -\$5 million worth in little more than a year - at the problem of rising Medicaid costs, a longtime budget-buster for states

Maine has invested in new client/server administrative systems, including a decision-supnext month, to support the state's shift to a managed health care model.

Instead of processing individual claims from elderly and poor citizens covered by Medicaid, Maine wants to cut waste and fraud by tracking patients' health and seeking ways to prevent costly illnesses before they

Maine's systems are expected to help the state reduce its Medicaid costs by \$3.5 million annually starting this year, said Jim Gorman, deputy director of Maine's Bureau of Medical Services in Au-

Like other states around the U.S., Maine is under infinancial pressure to shift its

Medicaid program to a managed istrators easier access to inforcare model for its 160,000 re-



Capitation and decision-support systems may help Maine reduce Medic ald expenditures

state's Medicaid costs account for one-fourth of the state's \$1.1 billion medical services expenditures, and those costs have been spiraling upward at 15% per vear since the early 1990s.

The cost-savings from the new systems will be achieved partly by providing admin-

Maine, page 68

IS bounty hunters dig deep to draw technical talent into the fold

CONTINUED FROM PAGE 67

more. For employees who refer qualified friends and family members for interviews, there are dinners at fine restaurants, theater tickets and referral bonuses — sometimes in the thousands of dollars.

The U.S. Department of Labor is projecting a 90% growth in jobs for systems analysts and computer engineers between 1995 and 2005.

Meanwhile, colleges and universities are graduating 42% fewer computer science majors.

And new technologies are being introduced at warp speed, which is only exacerbating the skills crunch.

In 1996, software companies increased their employee base by an average of 34%, according to a Coopers & Lybrand survey of 500 firms. The average salary increase was 8%.

"Just throwing an ad in the paper now is not cutting it," said Ken Lieberman, a recruiter at GEC-Marconi Hazeltine, a defense contracting firm in Wayne. N. I.

As a result, the firm advertises on the Internet, recruits at job fairs and is considering running radio spots at a cost of about \$2,000 for a 30-second announcement.

Software engineers who join GEC-Marconi get a signing bonus of between \$5,000 and \$10,000, which they receive "when they walk through the door," Lieberman said.

SEEK THEM OUT

Sanchez Computer Associates, Inc. in Malvern, Pa., is encouraging job candidates who frequent Flanigan's Boat House—a restaurant in a nearby technology-oriented corporate center—to "steal this coaster, and win a free lunch."

The restaurant later this month will use bar coasters that

advertise technical jobs at Sanchez, a banking services software firm.

Flanigan's is patronized mostly by young people who work at the corporate center. Qualified candidates who bring a coaster to an interview at Sanchez will receive a certificate for a free meal.

Sanchez currently is looking for 20 to 25 programmers, said Debbie Mikulak, vice president of human resources at the company.

Hank Delavati, chief information officer at Quantum Corp., a disk manufacturer in Milpitas, Calif., advertises in the newspapers and on the Internet and, less frequently, hires an outside agency to recruit qualified IS workers.

"Their fee is usually higher, but when you really need someone for a project, you've got to pay what you've got to pay," he said.

FINDERS' FEES

Delavati also just increased the bonus — from \$1,000 to \$5,000 — that Quantum pays employees for referring qualified IS professionals who come to work at the company.

"My personal experience is that bonuses don't encourage job-hopping," Delavati said.

Still, he said, "My highest priority is not just acquiring employees, but retaining them with good job content and training. From my perspective, shame on me if I were losing people just because a friend of theirs gets a couple of thousand dollars to recruit them [for] another company."

Still, recruiters will try — anytime and anywhere — to win new hires.

Gerry Hussey and Michael White, both recruiters at Sapient Corp. in Cambridge, Mass., were out with dates at an Arnold Schwarzenegger movie when they spotted a guy in a Sybase T-shirt sitting a few rows in front of them.

They immediately went to work on recruiting him for the systems integration firm.

"As a recruiter, you have to turn every rock over. You can't rely on a single source," Hussey said.

Panel urges free telecom trade

By Marc Ferranti New York

BY TURNS PLEADING and threatening, industry and government advisers from around the globe are seeking to put World Trade Organization (WTO) negotiators on the path to a successful conclusion in their telecommunications talks.

WTO telecom talks reopened last week. Talks were suspended last April when some countries declined to put offers on the table and negotiators from the most industrialized countries reached an impasse on issues related to national-market access for foreign companies. The new deadline for the talks is Feb. 15.

Massive private investments are needed to build the telecom infrastructure for networks such as the Internet that form the underpinnings of today's global economy, according to a panel of private sector leaders and representatives from developing countries that convened last week. But companies won't invest without an agreement that lays down the rules for a stable, open global market, the panelists said.

"The opening of the markets in telecommunications should produce a springboard for the rest of the revolution to occur, which is the global information revolution," said Bowman Cutter, managing director of investment firm E. M. Warburg, Pincus and Co.

The investment required to upgrade global networks and create infrastructure in developing countries is estimated to be between \$200 billion and \$300 billion, Bowman said.

Ferranti is an IDG News Service correspondent in New York.

Maine

CONTINUED FROM PAGE 67

mation about Medicaid recipients. Administrators can use that information to identify preventable health problems, such as determining whether a pregnant Medicaid recipient is a smoker, thereby placing unnecessary risks on herself and her unborn child.

The systems are also expected to help the state reduce fraudulent practices such as "docshopping," in which some Medicaid recipients intentionally visit several doctors for the same condition to fill multiple prescriptions.

CENTRAL DATABASE

Thanks to a new online point-ofsale pharmacy system, all prescription information will be stored in an online database for Maine's pharmacists, physicians and administrators to monitor.

Gorman said estimates show that waste and abuse in U.S. health care account for roughly 10% to 15% of the nation's total health care bill. For Maine, that translates into \$100 million in fraud that the state can potentially eliminate, he said.

Gorman, who oversees the supporting technology initiative, said his biggest challenge has been finding distributed systems technicians who will work for less money than they can get in the private sector.

JOB OPENINGS

Gorman has already hired a team leader and a Unix systems administrator. But he's still eight people short of filling his distributed sys-

SYSTEMS

tems staff, which includes openings for a Visual

Basic programmer and two middleware specialists — one who is fluent in Object Management Group's Common Object Request Broker Architecture and one who knows BEA Systems, Inc.'s Tuxedo.

"If you want a nice place to live and work, it's a lifestyle choice," said Gorman, who along with the rest of his 19-person information systems staff works in Augusta. "But the government doesn't pay as much as the private sector, so we're still having trouble finding people," he said.

Gorman and his staff have managed to keep the technology project on course by hiring Cambridge, Mass.-based Sapient Corp. and Hewlett-Packard Co. to help with the hardware and software installations.

The software, which Maine officials developed with Sapient, includes a Unix-based client/ server system called the Maine Managed Care Enrollment and Capitation System (MECAPS). MECAPS, which went live last July, was designed to help 80 health benefits advisers at the Bureau of Medical Services enroll Medicaid recipients into

health maintenance organizations and monitor and update
their Medicaid eligibility.

So far, the state has enrolled 15,000 Medicaid recipients into the state-run Primecare managed care program. Officials plan to have all the state's Medicaid recipients enrolled in managed care by 2000, Gorman said.

That goal is a stiff challenge for Maine and other states that are struggling to reform their Medicaid programs. Most Medicaid recipients aren't familiar with managed care, "so there's a lot of work [for the states] to get recipients to sign up and understand the new policies and procedures that it brings," said Jane Metzger, a consultant at First Consulting Group, Inc. in Waltham. Mass.

Tribune Co. grows its own

CONTINUED FROM PAGE 67

The site is managed by webmaster Jackie Harn, who until a few months ago worked at the company exclusively as an administrative assistant

"HTML training is what I took," Harn said. "Plus, I'm surrounded by a lot of people who know a lot. Every day is a

learning experience, and technology is definitely the hot place

As webmaster, Harn is responsible for putting up new HTML pages on the site and overseeing its general content.

"We want to get to a point where people don't think twice about Web publishing. We have a lot of awards for graphic design. We're trying to get these people immersed in this, as well as on the theory that those skills are transferable," Scherb said.

"As a newspaper and as a broadcasting company, we have lots and lots of creative people. The key is getting them comfortable working in this medium," he said.

Managing

By Robert L. Sch

How do you organize your year 2000 project?

Create a central office

that can act as coach,

manager, motivator

and cheerleader,

IS executives say.

Big .Brother, phone home. We need you.

That's what IS executives are saying as they organize their year 2000 projects. Without a powerful, knowledgeable nosy program-management office, the critical work of converting applications so they can distin-

guish between the years 1900 and 2000 could founder and take your career with it.

The problem isn't that year 2000 work requires exotic new project management skills. It's that the work demands more of the traditional project management skills than most information systems managers have. Observers say that's why it's so important to concentrate the money, expertise and clout in one strong program-management office, which can then advise and coordinate individual project managers.

"It's a very, very demanding, time-boxed project that has thousands of variables," says Bob Adkinson, director of computer services at Dayton Hudson Corp. in Minneapolis. "You need a project manager who can handle lots of stress and pressure, who can handle 24-by-7 [all day, every day] project management and resolve conflicts.'

For example, "one large airline is looking for 500 people to do their year 2000 conversion," says Richard Saulsgiver, a senior technical manager at Computer Management Consultants, Inc., a consulting firm in Tampa, Fla. "How many project managers do you know, other than CEOs or CIOs, who have ever managed more than 50 or 100 people?"

Many IS managers fail in basic project management skills

Rick Hunter and Katherine Schrup are key players in the year 2000 conversion project at Kaiser Permanente Northern California



OPERATION

CONTINUED FROM PAGE 69

such as tracking the actual start and finish dates of tasks to identify problems before they balloon out of control, says Laura Leitzinger, a senior manager at Deloitte & Touche Consulting Group in Chicago.

HIGHLY KNOWLEDGEABLE

Rick Hunter, a project manager at Kaiser Permanente Northern California, is about halfway through the conversion of about 15 million lines of code. Hunter's staff, part of the IS organization at the health maintenance organization, is doing the work itself rather than leaving it up to each business unit. "It's important to quickly come up with a set of [standards and a methodology]... so that each time you go through it, you're doing the same thing, the changes are uniform throughout your application suite and they'll integrate with each other," he says.

"Centralize this under one IS executive," Adkinson recommends. "If you turn your entire IS staff into a year 2000 [team], the first project and the only project they do will have errors and bugs in it. The fewer players you have [learning how to do the work], the higher the quality at the end of the project."

Having started in mid-1994, Adkinson is finishing year 2000 work for Dayton Hudson's 700-plus Target stores. He says he hopes he can avoid similar conversion efforts for Dayton Hudson's namesake department stores and its Mervyn's stores by developing common applications for all three divisions.

"The people closest to the applications have to do the [actual conversion] work." says Bruce Hall, a research director at Gartner Group, Inc. in Westboro, Mass. "What you can centralize is enterprisewide reporting, coordination, dealing with vendors, dealing with partners, reporting to management" and collecting and redistributing year 2000 tools and processes. Those range from a central clearinghouse for off-the-shelf software that is year 2000-compliant to detailed compliance specifications and tests.

HIGHLY VISIBLE

Like Big Brother, a year 2000 program office has to be constantly visible, drumming home the message to top managers and everyone else that the work is as important as short-term strategic projects (see story at right).

Pressure to divert people or money from year 2000 work is an ever-present threat, even when companies have signed year 2000 contracts with outsourcers. One example is Yellow Technology Services, the IS arm of \$3 billion trucking company Yellow Corp. in Overland Park, Kan.

"The year 2000 activities are being viewed as an under-the-cover, backroom type of necessary conversion activity," says Jim Gillespie, project manager at Yellow Technology Services. At the same time, customers still demand IS projects "that are actually going to add functionality and value to them in 1997 and 1998."

Even though Yellow Technology Services has contracted with Syntel, Inc. and Andersen Consulting to convert approximately 15 million lines of Cobol and assembler code, Gillespie predicts his biggest headache will be juggling year 2000 work with higher-payback projects.

Gillespie stays highly visible; he holds a monthly year 2000 steering committee meeting where he reviews the company's master conversion plan with senior business managers. Every other month, he does the same for the whole 400-member IS staff.

In Phoenix, Stan Price, the city's former year 2000 project manager, had to make the same presentation twice to the same IS managers to get their backing for year 2000 funds. "There was quite a bit of denial... as to the extent and depth of the problem," says Price, who now heads year 2000 work at the Arizona Department of Revenue. "It was scary," he says, because "you can't afford to let time run out on this project, so you had to be successful. And yet, there was a lot of skepticism to deal with [among] the people who hold the key to your future, as far as the budget is concerned."

HIGHLY NOSY

Part of being a good year 2000 project manager is "being an investigative reporter," Leitzinger says. That means looking for things that don't look or feel right, "digging to get to the root of the issue and bringing other folks in" to fix it.

Katherine Schrup, a project coordinator at Kaiser, hunted down all the development support people who would need to coordinate year 2000 work. "It's always better to overcommunicate than to undercommunicate." she says.

For Schrup, overcommunicating extends to sending informational memos and electronic mail, even to managers she doesn't think are affected. Sometimes, she says, they'll pass messages on to other managers and, "I discover there's this whole new business going on we didn't know about. And by golly, we need to keep them in the loop."

FINDING BIG BROTHER

As Clint Eastwood said, a man has to know his limitations. "One thing we see consistently is the best technical managers don't necessarily make the best project managers," says Mark Wakelin, a vice president at The Constell Group, Inc., a management consulting firm in Elmwood Park, N.J.

If an IS manager knows he lacks the skills to manage a year 2000 project, Adkinson recommends seeking help. Huddle with your top IS talent, explain the skills needed to solve this mission-critical problem and "look real seriously at doing some transfers [or] some job swapping," he says. If you can't be Big Brother yourself, find someone who can be.

Scheier is Computerworld's senior editor, management.



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1076 YEAR 2000

An occasional series COREBOARD on year 2000 trends, issues and statistics

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ne message from Vito C. s Angeles attorney who month's Year 2000 Issues ers Conference in Chicago, red by Digital Consulting, Inc. in over, Mass

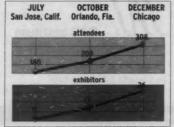
Bringing in lawyers will help illustrate the exposure a company's directors and officers could face if noncompliant software causes a company, or part of it, to fail. Peraino advised.

And the best way to sound the alarm to upper-level managers may be on the golf course or over lunch rather than via internal memo, Peraino said. Leaving a paper trail of warnings could make you more vulnerable on the witness stand if your company is taken to court because of a failure in its year 2000 fix.

As for the legal profession and the year 2000, "the lawyers are circling like sharks," author and software methodologist Ken Orr said in another address at the conference. "I tell my kids to know their Cobol and go to law school at night," he said.

Growing awareness

If you think there's increased awareness and alarm over the year 2000 date problem, look no further than the numbers of attendees and exhibitors at last year's three Year 2000 Issues and Answers conferences sponsored by Digital Consulting:



Source: Digital Consulting, Inc., Andover, Mass

Outside help

If the lawyers can't drive home the millennium message to the upper brass, whoever audits your company's books might do the job for you.

Representatives of two of the Big Six accounting firms - Price Waterhouse and Ernst & Young - say the firms' auditors may discuss the issue with their clients during the course of their work.

Randy Fletcher at Ernst & Young says his firm is making sure the top levels of a company are aware of the problem, if not attacking it. And if a company has a problem, he says, "we'll want to monitor that in the next few years."

And Dave Kaplan, a partner at Price Waterhouse, says, "Companies need to consider as soon as possible" what they should be doing to make their software year 2000-compliant. - Rick Saia

Seeking action in D.C.

With the 105th Congress seated and President Clinton being sworn in to a second term today, key Democratic lawmakers are pushing for more government action on the year 2000 problem, the Information Technology Association of America (ITAA) reports.

Sen. Daniel P. Moynihan of New York plans to reintroduce a bill that would create a federal commission to study millennium compliance, analyze costs and provide immediate recommendations and requirements to the president, Congress and the Defense Department. (In recent Computerworld report, critics charged Clinton, Congress and top Pentagon leaders with not moving aggressively enough to avoid serious problems at Defense.)

Moynihan, the ITAA reports, is particularly interested in how compliant the government's finance agencies are.

Also, according to the ITAA, Rep. John Dingell of Michigan has asked the Securities and Exchange Commission (SEC) to provide annual compliance status reports on the SEC and the entities it regulates, such as the stock markets. Dingell says the year 2000 problem could harm individual investors because trades and interest may not be properly credited.

The right fit

Dave Bettinger discovered that starting a sideline business can help him make a mark in the world.

Bettinger, who by day is a senior technical writer for his company's year 2000 conversion project, joined millennium consultant Peter de Jager's Internet mailing list last year. Some people on the list said they ought to have their own T-shirts to highlight century date conversion work.

So Bettinger, who lives in Brunswick, Maine, formed Project 2000, Inc. (www. clinic.net/users/project2000/project2k. htm), which prints T-shirts, sweatshirts, polo shirts and baseball caps for conversion project teams and year 2000 service providers around the world.

The logo on the clothing consists of a globelike sphere with 'Year 2000' stretched halfway around it.

Bettinger's customers come from the U.S., Europe, Canada and Australia. They tell him the shirts and hats are gimmicks that "draw some identity to the [year 2000] team and sort of makes them stand out a little bit.

"It's not going to be a morale booster, but it's certainly going to make it more fun," Bettinger says. "It gets visibility throughout the company." - Rick Saia

DO YOU HAVE ANY TIPS, SUGGESTIONS OR IDEAS ON THE YEAR 2000 PROBLEM? SEND THEM ALONG TO RICK SAIA, ASSOCIATE EDITOR, MANAGING (RICK_SAIA@ CW.COM).

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Visit our Web site (www computerworld.com) this week for the debut of our year 2000 page, where you'll find the most recent articles and features on the millennium date problem.



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PENDULUM SWINGS BETWEEN ROCK AND HARD PLACE



harles de Gaulle once said he had lived an honorable and useful life but could truthfully say he never saw a problem solved. That may be the epitaph for many IS managers.

During the past 30 years, IS has tried repeatedly to resolve the same basic set of problems that at times have threatened its very identity, credibility and even existence. These are "classic" problems in that they have no final or single solution.

The problems include the relationship between designer and user of systems, the trade-offs in design between completeness and timeliness, the nature of effective design, the relative priority of investments in applications and infrastructures and, above all, the balance between central coordination of the enterprise IT resource and decentralized autonomy in decision-making and use.

Just about every large company faces a mix of these classic problems. Senior business executives keep looking for the answer. What if there isn't one? What if the underlying problems are part of a fundamental tension that is like a swinging pendulum?

The swing of the pendulum in the business use of IT has long been, is and will continue to be from innovation to discipline, back to innovation and back, again and again. It's this swing that makes IT such a political issue. When does the organization need a strong, central IS group for governance and oversight? When must it loosen central coordination and encourage local invention, case-by-case prioritization and matching of applications to fast-moving business demands? There really isn't

If you look at the history of IS, it's been a constant balancing of answers. In the 1970s, IS got stuck in the mode of overdiscipline and central control. The PC was the force that liberated local units from the iron hand of dataprocessing bureaucracies. The swing of the pendulum brought a wave of innovations first and then the erosion of IS identity and authority in many firms.

The pendulum continued to swing. The firms that best established a real dialogue between business and technology recognized the need for a blueprint for integration, an enterprise architecture backed by corporatewide standards and policies. The very same LANs that emerged to provide local autonomy in the use of computers as a business tool were seen as needing standards to ensure heterogeneous LAN/WAN/LAN interoperability. Help desks, economies of central expertise and network

management tools contributed to much of the recentralization of distributed computing — distributed technologically, organizationally and in terms of authority and responsibility.

Now, intranets and multimedia are part of the next swing. Corporate IS will once again be seen as an impediment in many instances. Then, as the threat of even more multitechnology chaos becomes apparent — well, to quote de Gaulle's contemporary, Yogi Berra, it will be deja vu all over again.

The rise of the CIO was seen as the classic answer to all the classic problems. Now, even the CIO is seen as part of the pendulum. A recent roundtable of executives and IS experts published in the Harvard Business Review determined that what's going wrong is that CIOs still lack business credibility and understanding. The panel concluded that the next replacement should be someone who is a true businessperson. That won't work for long, either. Overseeing the design, implementation and operation of the enterprise multimedia network demands a true technology officer.

What the constant swing of the pendulum means is that a plurality of business managers is almost always dissatisfied with IS. Worse, top managers see IS as a recurring problem rather than understanding that IS lives with the pendulum problem. No matter how well-suited IS' organization, activities and strategies are today, tomorrow is almost here. There are answers, but not the answer.

The starting point for evolving the new IS generation, though, has to be to give up the search for the answer. The challenges for IS in 2007 and 2017 will be fundamentally those of 1967, 1977, 1987 and 1997. And the solutions in each of those periods will create the next problems.

Depending on the month, Keen is an author, consultant, public speaker or professor in Great Falls, Va. His E-mail address is pgwk@aol.com.

Web wooing

You may snare college recruits as well as customers with an attractive World Wide Web page, according to a recent nationwide survey.

The study, "How College Students Connect with Employers," was commissioned by Bernard Hodes Advertising in New York, which specializes in recruitment advertising and employee communications. More than 1,600 college juniors, seniors and master's degree candidates partici-

pated in the survey last spring.

Students said they use recruitment brochures as their primary job information source, followed by the internet.

Among the findings were the following:

- During the 1995-96 academic year, 56% of survey participants had accessed at least one corporate Web site for job opportunities. Most sought full-time work and were most likely to be white males majoring in engineering or computer science.
- •Thirteen percent applied for a job through a company's Web site.
- Those who used the Web to research potential employers were, on everage, more impressed by a firm's use of technology than were students who didn't use the Web.

Despite the results, there apparently is no substitute for the human touch: More than 77% of students who participated in the survey used their schools' career services offices to job hunt, and 74% attended at least one career tall.



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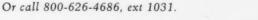
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Buyer's Guide

PRODUCT REVIEW: Norton Utilities 2.0 for Windows 95
PRODUCT REVIEW: Windows 95 Upgrade

NORTON AND WINDOWS 95: AN ODD, BUT USEFUL, COUPLE

By Jeffrey Gordon Angus

A YEAR AND a half after the debut of Windows 95, a second generation of operating system-enhancing utilities has arrived.

More people will pay attention to Symantec Corp.'s Norton Utilities 2.0 for Windows 95 than the other packages because of Norton's pedigree.

Version a.o for Windows 95 is a clever package that offers more than its competitors. But the product has its drawbacks. First, it still seems to carry a world view more appropriate to its DOS roots than to Windows 95. Second, it's still a pile of programs clumped under one product. The original Norton Utilities package was an early

DOS offering and included a host of barely related tools with propeller-head names such as "SI." It required a pretty good comfort level with the dreaded DOS command line.

While later versions added a somewhat insulating shell to the potpourri, Norton Utilities was a favorite of power users and not something to be deployed to the masses. Every iteration made the product bigger and required improvements in the interface and documentation to maintain an ease-of-use balance.

Norten Utilities is still a boatload of

programs tenuously tied together under one product. Apparently, Symantec is content to just add functions and ease-ofuse features without examining the basic assumptions of such a utility package who the users are and how they think. Symantec has taken this approach despite Microsoft Corp.'s effort to make Windows 95 an easy-to-use operating system and Windows 95's deep penetra-

Norton Utilities

Version 2.0

Symantec Corp.

Cupertino, Calif.

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tion into the homeuser and low-tech users markets. For those low-tech users in your organization, Norton provides more functions and complexity than they need or can handle.

Norton Utilities 2.0 for Windows 95 has some useful

new tools. Most important to advanced Windows 95 users are the two registry utilities: Registry Editor and Registry Tracker. From a systems support perspective, the Registry is the key difference between Windows 95 and its Windows predecessors. It replaces the host of .IMI files with a hierarchical, single-source file for configuration information. There's some good news in that change, but the bad news is that the relatively simple statements in an .IMI file are replaced with a C-like language, nothing you'd let even an intermediate end-user mess

with. And the solution to most problems that Windows 95 itself can't solve are centered, more often than not, right in the Registry.

While Windows 95 has an intrinsic registry editor, the Norton version is better. It includes multiple tabs in an additional window. One tab is sort of an online glossary that defines the folder that cursor is on. When there is a definition available, it's pretty informative, but only if you already know about the registry. If you don't know much about the registry this is no way to learn — you can

still do dangerous things, such as delete needed entries, if you're not careful.

The Registry Tracker works much like an uninstall program and audits

each change to the registry made by each installation program. If your system buys the farm after you install a new program, you can back out of the transactions and revive your computer. It also has a function for tracking elements installed by programs but no longer needed.

On my system, the function identified a gaggle of entries made by Norton Utilities itself. Those lines either were needed and incorrectly identified or weren't needed but were left by the Norton installer. Ideally, you could remove the extraneous entries, but it wouldn't pay to guess. Either way, Norton Utilities was culpable.

Another bug was in the installer, I suspect. After it made a clever automatic telephone call to Norton's bulletin board system with registration information, it locked up the modem by convincing Windows 95 that another program was using the modern. Cold boots, removing all start-up programs except Norton Utilities and going into DOS and re-initializ-



Norton System Doctor tracks a multitude of system elements

ing the modem all failed to cure this problem. And technical support was no help. My a9 calls to Symantec over a three-day period yielded nothing but busy signals.

Norton File Compare is another utility new to this version, and it's a good idea. But its implementation is a revision away from being truly useful. The idea is to be able to look at multiple versions of files

Norton, page 81

WINDOWS 95 UPGRADE REDUCES WASTED DISK SPACE

By Chris DeVoney

F YOU'VE purchased new PCs in the past few months, you may be running a new release of Windows 95 without knowing it. But you should know about the upgrade because you can take advantage of some neat new features. Many computer manufacturers have hidden the second OEM service release (OSRa) of Microsoft Corp.'s Windows 95 under the covers since its fall introduction.

You can tell whether you are running OSR2, designated as Version 4.00.950 B, by checking the System applet in Windows 95's Control Panel. The new release

is a series of patches, upgrades, add-ons and changes to the original Windows 95 product. The changes include support for the multimedia functions of the upcoming Intel Corp. MMX-based computers, improved wizards for installing new driv-

Most disk operations can now run 10% to 15%

faster.

ers and new versions of Internet and multimedia

The most important change is support for FAT32, a new disk directory scheme that sup-

ports disk partitions of up to 8G bytes and significantly reduces wasted disk space. Using 32-bit entries in a disk's File Allocation Table (FAT), Windows reduces the size of a disk's clusters (the smallest area the operating system allocates to a file) from 32K to 4K bytes.

For systems with many small files, FATj2 is a godsend. Because most single-page documents, electronic-mail messages and World Wide Web browser cache pages take r6K bytes or less, you can store several more files in the same amount of disk space under the new scheme.

The scheme tested well with most disk

operations, running 10% to 15% faster, although disk defragmenting takes significantly more time. The downside is that you must use updated disk utilities, such as Symantec Corp.'s Norton Utilities 2.0 for Windows 95, with the new desk layout.

Microsoft's Windows NT can't read FAT32 volumes, so the new release is unfactually windows machines. Microsoft hasn't stated when FAT32 support will be added to NT.

OSR2 also supports varied disk formats, such as 120M-byte optical discs, Iomega Zip drives, CD-changers and

Windows 95, page 81

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 62. Programming Management
 63. Tressurer, Controller, Financial Officer
 64. Development (1) Windows NT
 65. Development (1) Windows NT
 66. Development (1) Windows NT
 67. Development (1) Windows NT
 68. Development (1) Windows
 69. Development (1) Windows

 - 4. Which of the following products do you buy, specify, recommend or approve the purchase of? (Check all that apply.)

 (a) I internet software
 (b) I internet browsers
 (c) I web authoring/development tools
 - 5. Do you use the Internet? 2 Yes 2 No

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PRODUCT REVIEW

NORTON AND WINDOWS 95: AN ODD, BUT USEFUL, COUPLE

CONTINUED FROM PAGE 79

(say SYSTEM.INI and SYSTEM.oo1) and compare them line by line, with indications of which lines were added, deleted or moved.

In principle, this is a fine utility, but this version incorrectly identified lines that moved as having been deleted, probably because the text in one was all uppercase and the other (identical in content) was all lowercase.

The Norton System Genie is the final new utility, and it also has some virtue, although future versions will be more useful. The Genie is a browser-based

interface (specifically Microsoft Internet Explorer 3.0) multimedia title that is an arristically elegant way to access specific question-andanswer format topics on how Windows 95

Norton Utilities is still a boatload of programs tenuously tied together under one program.

Windows 95 looks and runs. Some of the topics include hot spots that trigger actions designed to speed up processes or automate changes. System Genie is a good start, but it still contains just a few dozen topics and will require organizations standardized on Netscape Communications Corp.'s Navigator to install the Microsoft browser to use the content.

Power users and people who've been using Norton Utilities for years will certainly want to use this product. Intermediate and low-end users may find a competitor, First Aid 97 from CyberMedia, Inc. in Santa Monica, Calif., more accessible. It's a little more organized, has more hand-holding features and quicker response from technical support.

In the end, the saving grace of Norton Utilities is the written documentation. Unlike the product itself, which is a jumble of programs, the manual is task- and solution-oriented.

The manual organizes the programs by function — prevention, recovery, performance and information — and then details under each program the reasons to use it and the circumstance under which you should use it.

The documentation almost makes this a coherent product instead of a messy tool box full of very useful items. If the program designers would follow the intelligent path the documentation folk have beaten for them, this product's strengths could be unleashed to the general masses of Windows 95 users, instead of only experienced users.

Angus is project director at The Data Works Ltd. in Seattle.

WINDOWS 95 UPGRADE REDUCES WASTED DISK SPACE

CONTINUED FROM PAGE 79

removable integrated drive electronics media. It also handles 4G-byte CD-ROMs and CD-I formatted disks.

Portables get a boost from OSR2. Units sporting the Advanced Power Management 1.2 BIOS should see longer battery life through the support for multibattery PCs, drive spin-down, power-down of idle modern cards and wake-on-ring moderns. OSR2 also supports Cardbus (32-bit PC Cards), power-saving 3.3V

cards, multifunction cards and Global Positioning System PC Cards.

The corporate network also gets some help. Data Link Control connectivity moves to full 32-bit speeds and OSR2 offers full client

support for Novell, Inc. NetWare 4.x, including Novell Directory Services. Windows offers NDIS 4.0 drivers and support for network management applications using Desktop Management Interface 1.1 specifications.

The interface and scripts for dial-up

networking are improved. OSR2 handles the new Radish Communications, Inc. VoiceView and AT+V voice moderns, which can answer voice calls and switch between data and voice on the same call.

The new machines also save the information systems department some labor because OSR2 installs Microsoft's Internet Explorer 3.0, Internet Mail and News I.O, NetMeeting I.O, DirectX 2.0, Active-Move and OpenGL drivers and libraries.

In testing with a new Quantex Microsystems, Inc. desktop and a Gateway 2000, Inc. 2100 portable computer, OSR2 appeared to be relatively bug-free and should be immediately accepted on new machines. The problem is migrating OSR2 features to established computers. Although some updates can be loaded

from the Microsoft World Wide Web site, some features are exclusive.

The hurdle is FAT32. Microsoft hasn't provided a transition tool for established drives to move to the new format. That is understandable but not commendable. For now, you must run FDISK to set up FAT32 on a disk, and that destroys all its ex-

isting information. Until the next version of Windows, code-named Memphis, rolls out late this year, it's put up with the extra work or shut up.

De Voney is a reviewer in Seattle.

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MYOPINION

It should have been my idea

ROSS M. GREENBERG

best idea since the original Sidekick comes along, and it wasn't mine. I mean, it's a simple idea, solving a need we've all experienced with a solution we all wish had been our own. I know I do. Instead,

start-up company Mirabilis Ltd. in Tel Aviv (but with a New York site served by a T₃ line) had it first.

So what is it, already?

ICQ (I Seek You) is easier to use than to explain, but here goes:

It's an Internetwide ability to pass simple notes to other ICQ users. And to chat or page them. It can pass files or favorite uniform resource locators (URL) to other users, too. You can watch when members of your contact list are online anywhere in the world.

Take a gander at the ICQ product,



downloadable from the Mirabilis World Wide Web page at www.mirabilis.com. Don't waste your time looking for a price tag, though—there isn't one yet. And conversations with Mirabilis business personnel indicate there probably will al-

ways be a freebie version available. Only beta code is available now — but I've used production code of other companies' released products that crashes more frequently, taking out entire city blocks, or at least one of my disk partitions.

And consider this: Mirabilis has garnered 30,000 users so far, with no advertising at all, merely word of mouth. This is for a product only available — and only in beta — for the past four weeks or so.

I found the company's Web page and product by mistake, and later one of my fellow systems operators on The Microsoft Network (MSN) independently discovered it. Paul Mayer, who runs the shareware forum on MSN, posted a note to other systems operators saying "This is a cool product!" He was right — it suits our needs perfectly.

Every ICQ user registers (currently for free) and gets a personal number, called a UIN in ICQ parlance. That also comes with a free Web-pager page.

After you've registered, people who have you on their contact list will be advised when you're online and when you're off-line. I had a corporate chat I had to attend, and in the dead time between each scintillating comment, for which I waited with bated breath, another member of the corporate audience and I were having an ICQ chat. Another ICQ user was sending me pop-up electronicmail messages, and I was able to call somebody on a voice line to remind them to log on, because I could see the person was off-line (having slept through an alarm—by five hours).

ICQ is smart enough to record the current URL you're viewing in Internet Explorer or Netscape Navigator, and it allows you to easily send that URL to another ICQ user. That user receives it immediately if logged on and, with a single keystroke, their browser is brought up and that URL is displayed. Nifty.

You can set up a portion of your home page with some HTML tagging to allow others to add you to their contact books with a single keystroke. You can have private chats with one person or open chats with multiple people — or by-invitation chats, if you wish.

Currently, all through-the-server needs, such as Web-paging, go through the Mirabilis server. Intranet users have nothing to fear — ICQ knows all about how to use firewalls properly, and a special intranet-only server version is being worked on, full of even more features. And it never strays past your firewall.

There's a "user away from their desk" feature that you can turn on or let your screen saver turn on for you. When someone tries to contact an "away" user, they get a configurable message instead.

It's really a simple idea, done very well. It should have been mine, damn it. Mirabilis is close to releasing, and it's busy trying to figure out which of a plethora of OEM deals is the best. This is a better mousetrap, for sure.

Greenberg is a software developer in Bovina, N.Y., who specializes in Internet and security products. He can be reached at greenber @ramnet.com.

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- · Will the Telcos Own the Internet? IT Opportunities and Impact Gigi Wang, Senior Vice President, Communications Industry Research
- Outlook for New Internet Technologies
 John Gantz, Senior Vice President, Personal Systems and Services Research
- Software Economics Beyond Microsoft: What Works? Tony Picardi, Group Vice President, Software Research

Session A 1:15 - 2:00 Session B 2:15 - 3:00

Session C 3:15 - 4:00

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Japan and Asia/Pacific Market Outlook Pinippe de Marcifiac

Dr. Robert M. Metcalfe, Vice President of Technology, IDG

4:50

Coctail Reception

In Depth

Artifacts may prove scarce as competing technology

A Competing technology Museums become By Picarille

ICK ANYTHING considered to have some cultural significance — even if it's debatable — and somewhere there's a museum paying homage to it. Barbie dolls, toasters, automobiles, dinosaurs, television — even Spam is thus enshrined.

Meanwhile, art museums are everywhere; civic pride dictates that any major city feature at least one.

But somehow, the number of museums dedicated to preserving, archiving and showcasing the historical and social relevance of computers has been minimal.

There's the Computer Museum in Boston. It's been around for 14 years, and its history proves one man's junk is another man's treasure. The museum was start-

ed from a collection of old Digital Equipment Corp. mainframes that were headed for the junkyard. Legend has it that a truckload of Digital machines was actually on its way to the dump when the driver received radio instructions to turn back.

But beyond Boston's Computer Museum and its West Coast branch — the Computer Museum History Center (CMHC) in Silicon Valley, which opened in October — there have been few serious efforts to create a com-



Boston's Computer Museum, shown here, headed west to jar loose some Silicon Valley funding. But a San Francisco upstart has its eyes on IS history.

puter museum on a large scale. The Smithsonian Institution has a standing exhibit titled The Information Age, but because the Washington national museum has a lending agreement with the CMHC, it's not interested in collecting computer artifacts.

Still, there's growing interest in preserv-

Archival rivals, page 84

"Ninety-five

still within our

iumping on it

to get to the

beginning."

- Kip Crosby.

executive

director, CHAC

grasp. People are

before it's too late

computer history is

percent of

Archival

CONTINUED FROM PAGE 83

ing the history of computing. Maybe that's because the Internet is delivering computing to the mainstream. So while the industry tries to figure out where the future of computing lies and how to cash in on it, more people say it's important

to look backward.

"It's the zeitgeist, the spirit of the times," says Kip Crosby, executive director of the Computer History Association of California

(CHAC) in Palo Alto. "One of the main reasons for the sudden interest in preserving computing history is that it's a fairly recent phenomenon — 95% of computer histo-

ry is still within our grasp. People are jumping on it before it's too late to get to the beginning."

And in an industry filled with hype, one way to get to the truth is to document it in historical context.

Now there's a new kid on the block. Veteran trade journalist Frederic E. Davis is leading the effort to launch the San Francisco Computer Museum (SFCM) (www.fog.com), which has a three-pronged emphasis: history, art and hands-on exhibits designed to appeal to a broad mix of people.

The SFCM also hopes to leverage the fact that San Francisco is among the nation's top tourist destinations and that the Bay Area is chockablock with people who work in the computer industry.

One of the key elements of the SFCM, which could open as early as the end of the year if negotiations with the city stay on track, is a World's Fairlike exhibit that would feature futuristic technologies from a variety of companies. Visitors

could play and interact with exhibits.

Compare this with the more staid approach of the CMHC. "We are not interested

in being the Disneyland of computing," says Carol Welsh, managing director of the CMHC. She says the museum's collection can be viewed only by appointment.

The SFCM also plans to focus on digital art by showcasing multimedia and digital artists, which are often largely ignored by the traditional art world. "The true modern art is digital art," Davis says. "Most museums don't have the curators or the technical staff to maintain

and select digital exhibits, which means digital artists don't get the recognition for their work."

The SFCM also has a soft ware-archiving effort under way. The group plans to find the people who had original rights to software and operating systems and acquire the binary code. The museum

hopes to eventually store that code, documentation and source code on a World Wide Web server.

"Then we can look back and see the evolution of software creation," Davis says. "It's important to maintain computers in running order in the future, so they are not just artifacts. You'll actually be able to run them and see what things looked like."

Jeff Tarter, editor of "Soft-Letter," an industry newsletter in Watertown, Mass., says he would welcome more emphasis on software in the history of computing.

"Software has always played a very minor role in the [Computer Museum's] mix," Tarter says. "Historical hardware is the sort of thing that brings people to a museum. Early copies of VisiCalc and Word-Star are vastly more important, but it's hard to create an exciting exhibit out of a piece of software."

"For the social computing significance, it might be interesting to look at the source code for Bill Gates' original

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Basic program, the software that started his whole empire," Tarter says.

The CMHC is expected to cater to researchers, scholars, engineers and computer enthusiasts. Because Silicon Valley is seen as the birth-place of the PC, it made sense for the Computer Museum to branch out to the Bay Area. Temporarily located at NASA Ames Research Center's Moffett Field in Mountain View, Calif., the CMHC's collection tips the scales at more than 200,000 pounds, Welsh says.

The CMHC's collection is a mix of rare computers, firsts in their categories, historically significant machines and flops. The museum boasts a complete collection of computers designed by the late Seymour Cray. It also has software, product memorabilia, films, instructional videos, books, technical manuals and documentation.

Welsh says there's no way to put a dollar value on the CMHC's collection. "Nobody ever knows the value of this stuff until it's auctioned off," she says.

Having two computer museums start up in the same area at the same time could lead to some cutthroat competition for prime exhibits. Leaders from both the SFCM and CMHC met at the end of October to talk about the potential for competition. Although both groups agreed they don't want competition to degenerate to the level of snobbery that runs rampant in the traditional art world, no real cooperating agreement was reached.

Welsh says the Computer Museum and the CMHC are "graciously supported by the industry and private contributions." But one source familiar with the financial situation at the Computer Museum says finance may have played a role in its expansion to the West Coast.

That source also speculates that the CMHC is a transitional move and that eventually all operations will head west.

Despite the fact that the computer industry has made thousands of millionaires and a handful of billionaires and spawned numerous multibillion-dollar companies, it is considered a less-than-philan-thropic industry. Some wonder if there's enough financial support for multiple museums.

"It might be better to have one modestly funded museum than two impoverished collections," Tarter says. "So far, the computer industry has barely been able to support one."

Picarille is Computerworld's senior editor, Apple and software suites. Her Internet address is lisa_picarille@cw.com.

The one that got away

By Steve Ulfelder

he best computer exhibit in the world is vibrant, forwardlooking and interactive. It's also 4,000 miles and one ocean away.

The fact that such a center is in Linz, Austria, rather than Silicon Valley or along Route 128 in Massachusetts, ought to make the U.S. technology community blush.

Set smack on the Danube River in the third-largest city in Austria, the aggressively avante-garde Ars Electronica Center (www.aec.at) calls itself the "museum of the future." Visitors get a hands-on, interactive technology experience.

Horst Hortner, technical director of the center, says he wanted people to see the "true technology, not curtains and specialists." In that spirit, little is hidden at the center. Much of the cabling is visible, and most displays' servers are displayed proudly.

Visitors who crash (it happens) are assisted by one of Hortner's information systems staffers. There are 10 full-time IS workers and more than 60 volunteers. They do a bit of everything, from writing C++ code (Hortner is preparing at least one Java application) to tinkering with PC drives right on the museum floor.



The center's star attraction is the Computer-Aided Visual Environment (CAVE), a virtual-reality theater. It accommodates up to 12 people, led by one "masterguide" who controls the group's movements through cyberscapes that range from mathematical equations to virtual universes. The CAVE runs off more than \$5 million worth of Onyx servers donated by Silicon Graphics, Inc. that run Irix 5.3 software. A mere five CAVEs exist worldwide, and the Ars Electronica Center's is the only one publicly accessible.

One exhibit showcases haptic technology, or virtual touch, from Cambridge, Mass-based Sensable Technologies, Inc. Visitors balance and toss virtual shapes up and down and marvel at the illusion of mass.

But that version of the product is more than a year old. When Hortner is told that a more recent demo is available, he is clearly nonplussed. This is a difficult time to be in the futurist business.

Nevertheless, business is good. The Ars Electronica Center hoped to attract 50,000 visitors in its first year of operation; it reached that goal in three months.

Ulfelder is Computerworld's senior editor, In Depth. His Internet address is steve_ulfelder@cw.com.



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IT Careers

J. D. Edwards' Nancy Becker was diagnosed seven years ago with degenerating joints, but she refuses to give up doing the work she loves



LESSOR LESSOR

By Rochelle Garner

Repetitive strain injuries are permanently altering the way some IS professionals work. **Industry reporter Rochelle Garner explores** the harsh reality she knows only too well.

I REALIZE I SHOULDN'T BE WRITING. My wrists burn and ache. My fingers tingle. But I have to earn a living. So despite having repetitive strain injuries (RSI) in both wrists, I marshal on, trying my best not to join the ranks of the permanently disabled.

Which is why, when I first recognized my symptoms last March, I wrangled a referral to an occupational therapist's office. There, in the heart of Silicon Valley, I discovered that these injuries aren't the exclusive domain of writers. Alongside me sat the white-collar professionals who helped build the computer industry.



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PAINFUL LESSONS

CONTINUED FROM PAGE 87

To my right was a high-level programmer from Hewlett-Packard Co. who is now limited to four hours of keyboard use a day. Behind us was a data analyst from Sun Microsystems, Inc. And to our left, a hardware designer. Together, we strapped on electrodes, plunged our arms into alternating hot and cold baths and popped moodaltering drugs to reduce the swelling in our wrists, arms and shoulders.

These computer professionals, trained in the latest technologies, had expected to work many more years for the corporate good. Now our contributions are limited.

In fact, I searched for new ways of pulling in income that don't require my sitting at a keyboard. No luck. But, as a writer who has covered the technology industry for

12 years, I wondered about these computer professionals and others like them. What kinds of futures do they face when they can no longer work as they once did?

NANCY BECKER IS ONE SUCH COMPUTER PROFESSIONAL. Becker, an Interleaf process manager at I. D. Edwards & Co. in

Denver, was diagnosed seven years ago with degenerating joints in her fingers, back and neck. Yet she refuses to give up the work she loves.

"I've rescheduled my life into meetings where I don't have to work on the computer so much," Becker says. "And two or three times a week, at the end of the day, my whole body goes into traction at my physical therapist's office."

Sound pleasant? Now here's the scary part: The U.S. Department of Labor estimates that about half the nation's workforce will suffer some sort of cumulative trauma disorder by 2000. In 1993, the last year for which information is available, the Labor Department reported 302,400 cases of RSI injuries. That's up from 23,000 in 1081.

Already, estimates of total annual disability claims range from \$563 million to \$2.4 billion. Bear in mind disability claims are filed only by people who require major medical intervention — people who have

had to find new ways of working and even new fields in which to work. They are all worse off than I am. And yet, I have seen my productivity and my income drop to a quarter of what it was last year.

That hasn't happened to Becker, partly because her new role in management reduces her time at the keyboard. And partly because she has health insurance that covers seven years of physical therapy. (My insurance permitted a whopping nine visits to a therapist.) And partly because she works at an understanding company.

Although Becker's new role in management had nothing to do with her RSI, J. D. Edwards has set aside positions in quality assurance, sales and consulting for injured programmers.

"We anticipated a worst-case scenario where people might have to shift careers to accommodate their injuries," says Greg Dixon, director of human resources. "So far, though, no one has asked for that kind of help."

Becker hasn't because she refuses to give up. "I had a doctor tell me to quit, and I said, 'There's no way in hell." she says, explaining her regimen of frequent breaks, exercise and meetings.

This raises another key issue when dealing with RSI:

I've assigned articles – and had articles assigned to me – on RSI. And yet, I blithely typed away for eight hours at a stretch with no breaks. — Rochelle Garner

attitude. Specifically, you can't expect someone else to make you better. Sure, surgeons can cut. But people typically lose about 20% of their strength and mobility after such surgery. And although physical therapy helps, all physical therapists will tell you that any improvement you make will depend on what you do on your own time.

"It's one thing to solve all of the equipment issues, but I have found that the crucial component in both preventing and getting over RSI is behavioral modification," says Dennis Mattinson, health and safety officer at Sun in Mountain View, Calif.

By behavioral changes, Mattinson means stretching, exercising, adopting better posture and taking frequent breaks. In fact, if you don't start taking breaks now — say every hour — you could end up like me and thousands like me.

But no one wants to change their routine. Take breaks every hour? That's for wimps. Sit up straight, with feet square on the floor? Get real.

"It's difficult to motivate someone who isn't injured," Mattinson says.

Let me try. Don't expect to recover from a repetitive strain injury in fewer than 10 months. That's the bestcase scenario if you take immediate corrective action. People such as Becker will never recover. Never. Injuries that have progressed to her stage will last a lifetime.

Chances are, you've heard all this before. I'd heard it all before, too. In my 10 years as a computer journalist, I've assigned articles — and had articles assigned to me — on RSI in the workplace. And yet, I blithely typed away for eight hours at a stretch with no breaks. I slouched over the keyboard. I leaned on my elbows.

"Once someone is injured, they come back with a doctor's order of no more than two to fours hours a day typing, in periods no more than a half-hour," says Gary Karp, an ergonomics consultant at Onsight Technology Education Services in San Francisco.

It's hard to be productive when you have to work like that, I know. But I believed I was safe from injury because I used a wrist rest when I was working. And that points out the fallacy about these injuries that most of us hold: That the right equipment will make things better.

"Many of my clients expect their pain to go away by spending 10 minutes with the doctor or having their company buy them a good chair or a glare screen," Karp says. "But we find that, at best, ergonomic equipment solves only about 40% of the problem."

Which is why, even at companies with impressive injury-prevention programs, computer professionals still get injured. Consider the following: Four years ago, Sun's average RSI-related disability claim was \$45,000 to \$55,000. Today, the average claim is \$3,500. Clearly, Sun has made remarkable inroads at preventing serious injury thanks to a combi-

nation of education, workspace assessments for everyone who asks and a corporate policy that recognizes that a \$500 chair, amortized over five years, is chump change compared with a disability claim. But remember that my colleagues in pain at the occupational therapist's office included a data analyst from this very company. Her recovery depends almost entirely on her ability to make a lifetime of change.

This raises a painful moral: No amount of ergonomic equipment will prevent serious injury if you don't take charge of your own fate. Yes, it's a pain to stop work every hour. But do it. And when you catch yourself hunching over the monitor, sit up straight.

Most large companies offer ergonomics seminars. Pay attention to them. I'm working hard to regain my previous level of productivity, but RSI recovery is painful and painfully slow. So take my advice: Change the way you sit and work. Because the alternative can be downright devastating.

Garner is a freelance writer in San Carlos, Calif.

Ergonomics made painless

Training product offers tips for preventing injuries

By Jeffrey Gordon Angus

raining people who work with computers on how to avoid injuries is always a good investment. The exact amount of money paid out each year by companies in lost work time and increased workman's compensation isn't known — estimates vary considerably, from a half-million dollars to \$2 billion annually.

But the biggest cost of technogenic injuries is never discussed: the low-grade diminishing of individual contributors' everyday effort.

ErgoKnowledge 2.0 from Graphic Media, Inc. in Portland, Ore, is a polished, multimedia computer-based training title. The product's audience is people who spend their days using technology to get their work done. It delivers practical advice for avoiding the health problems that can be side effects of that routine.

The CD-ROM runs on Windows 3.1, Windows 95 and Macintosh systems. It delivers about an hour of constructive advice broken down into bite-size lessons you can take at your own pace. It discusses the common points, such as precisely how to adjust your chair, keyboard

and monitor, and more tricky subjects such as lighting and the importance of stretching.

The product does an excellent job of using the multimedia approach. The canned video clips' personalities are pleasant and not too perky for

most observers. The graphics are clear in showing proper and improper body positions, so most people will be able to follow the guidelines. And it includes a lot of guidelines. I've been tracking this subject for my practice for a long time, and I found a few new suggestions to implement on the effects of clothing and foot

placement.

Each section has a test to reinforce learning immediately. There's a summary test at the end. I think the test is a bit too easy, so if someone flunks it, you

know they're clueless or picking random answers. The product includes an administrative module to track scores and training time or configure the product to include only specific pieces of the training.

Angus is a systems analyst at The Data
Works Ltd. in Seattle.

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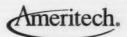
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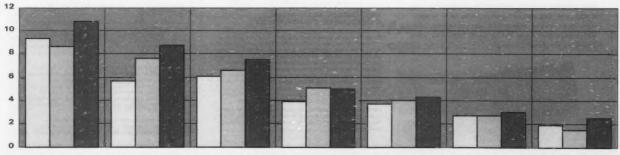


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Marketplace

INFORMATION MANAGERS **GETTING MORE**

By Steve Alexander

NE REASON WHY it's difficult to characterize personal information managers (PIM), or to select the right one to buy for an organization, is that their appeal is highly personal.

There are an awful lot of products out there, and the reason is because the 'P' in personal really counts. Whether a PIM fits with how an individual works varies with each individual," says Chris Le Tocq, a principal analyst at Dataquest in San Jose, Calif.

PIMs are PC software products for managing sales contacts and tasks, scheduling and organizing information. They range in retail price from \$50 to \$300. The PIM market is highly fragmented; no player holds a majority position and most only have a small percent of the overall market share.

Some PIMs are better at one function than others, so some analysts divide PIMs into task managers that emphasize scheduling and contact managers that emphasize client contact. Other analysts say the various PIMs are all just different flavors of the same thing. They cite market leader ACT from Symantec Corp., for example, which is best known as a contact manager but also handles task management and scheduling.

PC Data, a Reston, Va., market re-

search firm that tracks software sales, says that about 40 top PIM titles had \$40 million in retail sales in the first 10 months of last year.

"In general, the PIM market players that are doing well have a metaphor that is easily understandable," Le Tocq says. "Lotus Organizer uses a notebook and tab metaphor so that when you click, the pages flip. Day-Timer Organizer [from Day-Timer Technologies] has a strong brand name from the book products, and there are certain basic features they

Internet connectivity for scheduling is a new feature of PIMs. For example, Starfish Internet Sidekick from Starfish Software, Inc., the latest version of the product that practically defined the PIM category in the late 1980s, allows the user to make appointments and handle scheduling over the Internet.

"PIMs are becoming more like groupware," says Judy Hodges, research manager for applications and information access research at International Data Corp. in Framingham, Mass. "There's a growing trend to share contact information, scheduling and calendaring.

Internet connectivity is vital to PIMs if they are to enhance workgroup productivity, says Mike Gotta, senior research analyst for workgroup computing strategies at Meta Group, Inc. in Stamford, Conn. "The PIMs that survive will be the ones that become components that live within Web browsers. I think PIMs will become shared schedulers and use [Hypertext Markup Language] and other standards such as JavaScript as user interfaces '

Some analysts doubt that the PIM market will be hurt by Microsoft Corp.'s move to give away its Outlook PIM as part of its Office 97 suite.

PIM sales aren't likely to suffer, because Outlook is not perceived as a strong product among individual users, Le Tocq says. "While it is effective on a corporate level, there is still a vast amount of room for improvement on the personal level,"

Le Tocq notes that Outlook's predecessor, Microsoft Schedule+, has been shipping with Windows for Workgroups but hasn't been a runaway success as a standalone product. PC Data listed it as the 10th largest seller in the first 10 months of last year, with retail sales of about \$928,000.

PC Data says the PIM leaders in the first 10 months of 1996 were ACT, with retail sales of \$13.8 million, and Franklin Quest Co.'s Ascend and Organizer, each with about \$2.3 million in sales.

Alexander is a freelance writer in Edina,

ACT, from Symantec, (800) 441-7234, www.symantec.com, is used as a contact manager by sales groups that maintain continuous client communications. PC Data says ACT's average price during the first 10 months of last year was \$182.17. It had 35% of the market among the 39 PIMs PC Data tracked. Ascend, from Franklin Quest, (800) 877-1814, www. franklinquest.com, is strong in task management. PC Data says Ascend's price over 10 months averaged \$65.30. It had 6% of the market among the tracked PIMs.
Organizer, from Lotus Development Corp., (800) 343-5414, www.lotus.com, is an informa tion manager with strong calen dar features. PC Data says Organizer's 10-month average price was \$84.11. It had 6% of the market among the tracked PIMs. Ecco Pro, from NetManage, Inc., (408) 973-7171, www. netmanage.com, uses a list-mak-ing approach of outlines and folders. PC Data says Ecco's 10month average price was \$98.45. It had 5% of the market among the tracked PIMs. Gold Mine, from Gold Mine Software Corp., (800) 654-3526, www.goldminesw.com, is good for contact management and companywide management. PC Data says GoldMine's 10-month average price was \$195.92. It had 5% of the market among the

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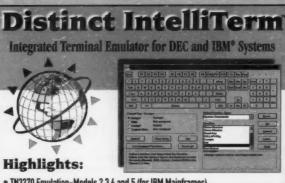
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The Week in Stocks



INDUSTRY ALMANAC

An Individual matter

ndividual, Inc. was founded in 1989 with the idea of making it easy for executives to stay up-to-date via fax on news that is important to their business.

Today, it gathers news from more than 700 sources daily and distributes customized news feeds through electronic mail, groupware, fax and intranet servers.

But the Burlington, Mass., company has had a difficult relationship with some investors following its initial public offering (IPO) in March 1996. The stock, which had ranged from \$14 per share to more than \$20, fell to about \$6 in July after founder and CEO Yosi Amram resigned amid disagreements regarding the company's direction. Amram sued, and in December the company reached an undisclosed settlement with him.

A class-action suit filed in November by investors alleged that the IPO didn't disclose the "profound disagreement" between the board and Amram Individual's officials say the suit is without merit, adding that there was no disagreement at the time of the IPO. Amram currently serves on Individual's board.

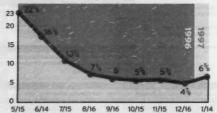
Despite the lawsuit, "I think the stock is very attractive at these levels," says James J. Petitit, an analyst at Hambrecht & Quist in San Francisco. He says Individual has \$30 million in cash and has been able to attract corporate clients with its product strategy.

David Takata, an analyst at Gruntal & Co. in Beverly Hills, Calif., says his firm doesn't plan to renew its intranet service from Individual, for which it pays \$1,200 per year. "I can get 95% of what I'm now getting for free," Takata says.

But Beth Smith, information manager at Genetics Institute, Inc., a biotechnology company in Cambridge, Mass., says Individual's intranet service has saved her company from manual clipping and news-gathering work. "It brings a lot of news sources together in one place. And it brings it right to the end user's desktop," she says. — Patrick Thibodeau

FADE TO FLAT

Individual's stock dropped and flattened following management changes. A stockholder class-action suit is pending.



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200	-	eastle:	o and Harmon Services		UPL	-
COMS	81.38	33,50	3 COM CORP.	72.25	0.13	0.2
AIT	66.88	49,63	AMERITECH CORP.	60.25	2.88	5.0
T	46.88	31.63	ATAT	38.13	-0.25	-0.7
ASND	75.25	31.00	ASCEND COMMUNICATIONS	74.00	8.13	12.3
BNYN	10.75	3.25	BANYAN SYSTEMS INC.	4.25	-0.63	-12.8
BAY	49.00	18.13	BAY NETWORKS INC.	24.25	3.75	18.3
BEL	80.38	43.50	BELL ATLANTIC CORP.	66.25	2.88	4.5
BLS	45.50	35.25	BELLSOUTH CORP.	42.00	3,38	8.7
BRKT	42.25	12.88	BROOKTROUTTECHNOLOGY	25.00	0.50	2.0
CS	43.63	26.50	CABLETRON SYSTEMS	35.13	1,50	4.5
CSCC	91.25	20.63	CASCADE COMMUNICATIONS	\$6.00	-1.06	-1.9
CGRM	24.13	11.63	CENTIGRAM COMMUNICATIONS	13.25	-0.38	-2.8
CSCO	72.63	32.50	CISCO SYSTEMS INC. (H)	72.25	4.25	6.3
CLIX	9.25	3,50	COMPRESSION LABS INC.	3.94	-0.13	-3.1
CMNT	10.50	4.00	COMPUTER NETWORK TECH.	5.88	0.00	0.0
XCOM	12.75	4.75	CROSSCOMM	8.25	2,63	46.7
DIGI	36.50	12.63	DSC COMMUNICATIONS	20.50	1.56	8.3
FORE	44.75	23.38	FORE SYSTEMS INC.	32.75	0.13	0.4
GDC	18.88	9.13	GENERAL DATACOMM INDS.	10.13	-0.38	-3.6
GSX	46.00	32.00	GENERAL SIGNAL NETWORKS (H)	45.75	1.00	2.2
GTE	49.25	37.75	GTE CORP.	45.63	2,13	4.9
UJ	53,13	29.75	LUCENT TECH.	51.75	1,63	3.2
MADGE	46.63	8.13	MADGE NETWORKS NV	12.88	1,25	10.8
MCIC	35.00	22.38	MCI COMMMUNICATIONS CORP. (H)	35.00	1.75	5.3
MNPI	34.50	5.50		12.38	-0.25	-2.0
NETM	18.88	5.25	NETMANAGE INC.	5.25	-0.88	-14.3
NTRX	10.88	3.75	NETRIX CORP.	5.88	0.25	4.4
NCDI	12.63	2.88	NETWORK COMPUTING DEVICES	12.63	2.00	18.8
NWK	36.00	11.13	NETWORK EQUIPMENT TECH.	17.75	0.75	4.4
NETG	30.25	15.00	NETWORK GENERAL	28.75	-0.50	-1.7
NN	37.25	20.25	NEWBRIDGE NETWORKS CORP.	33.25	1.13	3.5
NT	71.88	42.13	NORTHERN TELECOM LTD. (H)	71.88	3,13	4.5
NOVL	15.63	8.75	NOVELLING.	9.69	-0.19	-1.9
NYN	59.25	42.00	NYNEX CORP.	49.63	2.00	4.2
OCTL	31.75	12.63	OCTEL COMMUNICATIONS CORP.	17.25	0.00	0.0
DDSI	29.00	11.25	OFTICAL DATA SYSTEMS INC.	14.50	1.00	7.4
PAC	39.00	25.88	PACIFIC TELESIS	37.75	2.25	6.3
PCTL	44.72	20.69	PICTURETEL CORP. (L)	20,69	-3.69	-15.1
NOT	7.50	2.06	PROTEON INC.	2.75	-0.13	-4.3
RACO	7.00	3,50	RACOTEK INC.	3.88	-0.25	-6.1
RETX	10.88	1.88	RETIX	4.25	-0.75	-15.0
SBC	60.25	46.00	SBC COMMUNICATIONS	52.50	2.50	5.0
SFA	20.38	12,00	SCIENTIFIC ATLANTA INC.	16.25	0.38	2.4
SHVA	87.25	19.06	SHIVA CORP. (L)	20.63	-0.56	-2.7
FON	45.50	34.50	SPRINT CORP.	39.75	0.63	1.6
SMSC	18.75	8.38	STANDARD MICROSYSTEMS CORP.	9.13	-0.88	-8.8
JSRX	105.50	33.00	US Robotics	70.25	-2,75	-3.8
JSW	37.50	27.25	U S West INC.	33.50	0.88	2.7
CIRC	26.75	9.50	XIRCOM	26.75	7.31	37.6
	76.00	23.50	XYLAN CORP.	32.38	2.38	7.9

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AALR	15.25	6.13	ADVANCED LOGIC RESEARCH	11.63	-0.38	-3.1
AAPL	34.75	16.00	APPLE COMPUTER INC.	16.88	-1.13	-6.3
ASTA	9.00	3.94	AST RESEARCH INC.	4.81	-0.19	-3.8
CPQ	87.13	35.88	COMPAQ COMPUTER CORP.	78.25	0.88	1.1
DELL	67.88	11.50	DELL COMPUTER CORP. (H)	64.81	6.44	11.0
GATE	66.25	18.00	GATEWAY 2000 INC.	56.44	4.06	7.8
HWP	57.75	36.88	HEWLETT PACKARD CO.	53.88	0.00	0.0
MUEL	25.00	8.75	MICRON INTERNATIONAL INC. (H)	22.63	-0.75	-3.2
NIPNY	65.00	49.88	NEC AMERICA	60.00	1.13	1.9
SGI	30.38	17.88	SILICON GRAPHICS	27.63	1,50	5.7
SUNW	35.13	18.50	SUN MICROSYSTEMS INC.	31.31	4.31	16.0

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нма	14.00	6.75	AMDAHI CORP.	11.38	-0.50	4.2
DGN	19.13	9.00	DATA GENERAL CORP.	17.25	1.88	12.2
DEC	76.50	28.38	DIGITAL EQUIPMENT CORP	35.88	0.88	2.5
IBM	168.38	83.13	IBM (H)	164.25	1.88	1.2
MDCD	20.25	6.25	MERIDIAN DAYA INC.	7.06	-0.19	-2.6
NETF	6.38	2.25	NETFRAME	2.88	-0.25	-8.0
SONT	20.13	10.13	SEQUENT COMPUTER SYS. (H)	19.38	1.00	5.4
SEQS	5.63	1.88	SEQUOIA SYSTEMS INC.	2.13	-0.13	-5.6
SRA	32.13	16.63	STRATUS COMPUTER INC.	29.00	2.13	7.9
TOM	15.25	8.38	TANDEM COMPUTERS INC.	13.00	-0.13	-1.0
UIS	9.13	5.38	UNISYS CORP.	7.25	0.38	5.5

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	ADBE	45.13	28.50	ADORE SYSTEMS INC.	37.50	-2.00	-5.1
	AMSWA	7.81	3.63	AMERICAN SOFTWARE INC. (H)	7.38	0.06	0.9
	APLX	42.50	18.13	APPLIXING.	24.63	1.13	4.8
	ARSW	82.75	21.00	ARBOR SOFTWARE	02.63	3.13	10.6
	ADSK	44.25	18.50	AUTODESKING.	28.88	-1.50	4.9
	BGSS	29.50	14.88	BGS SYSTEMS INC. (H)	27.75		12.1
	BMCS	49.75	18.63	BMC SOFTWARE INC. (H)	47.50		-3.1
	BOOL	25.25	13.25	BOOLE AND BABBAGE	22.75	-0.38	-1.6
	BORL	21.25	4.75	BORLAND INT'L INC.	6.50	-0.31	-4.6
	BOBJY	55.50	8.63	BUSINESS OBJECTS	12.63		-11.4
	CAYN	11,88	3.81	CAYENNE SOFTWAREING.	4.44		2.9
	CNTR	7.00	2.63	CENTURA SOFTWARE	4.00	0,44	12.3
	COGNE	39.50	11.13	Cognos Inc	25.88		1.0
	CA	67.88	35.38	COMPUTER ASSOCIATES	44.88		-5.3
	CVN	14.13	5.75	COMPUTERVISION CORP.	7.50	0.13	1.7
	CPWR	62.25	16.00	COMPUWARE CORP.	57.75		9.2
	CSRE	32.00	10.75	COMSHAREINC.	17.00		-9.3
	COSFF	13.88	6.56	COREL CORP.	7.44		-0.8
	DWTI	8.25	2.63	DATAWARE TECHNOLOGIES INC.	4.13		10.0
	FILE	67.00	19.13	FILENET CORP. (L)	21.00	-1.00	-4.5
	FRTE	81.75	24.75	FORTE SOFTWARE	33.75	0.00	0.0
	FTPS	15.88	4.88	FTP SOFTWARE INC.	6.69	-0.56	-7.8
,	HUMCF	47.63	23.00	HUMMINGBIRD COMM, LTD.	32.13	2.13	7.1
	HYSW	25.50	9.75	HYPERION SOFTWARE CORP.	25.50	3.00	13.3
	IRIC	16.38	11.00	INFORMATION RESOURCES (H)	15.63	0,63	4.2
	IFMX	36.75	16.88	INFORMIX CORP.	23.63	1.63	7.4
	INGR	20.13	8.63	INTERGRAPH CORP.	9.88	-0.25	-2.5
	LEAF	10.25	1.81	INTERLEAS INC.	2.00	-0.06	-3.0
	ISLI	16.38	7.50	INTERSOLVING.	9.63	0.25	2.7
	INTU	69.50	25.88	INTUITING.	34.88	-1.38	-3.8
	TLC	30.31	13.38	LEARNING CO. (THE)	15.50	0.88	6.0
	LCWX	22.25	5.25	Locic Works	8.00	1.50	23.1
	MAPS	18.00	7.50	MAPINEO CORP.	9.00	-1.13	-11.1
	MATH	9.25	2.75	MATHSOFT (L)	3.50	-0.25	-6.7
	MCAF	52.88	14.63	McAres Associates	49.00	0.31	0.6
	MENT	18.50	7.38	MENTOR GRAPHICS	10.13	0.06	0.6
	MIFGY	21.25	8.38	Micro Focus	17.50	1.75	11.1
	MGXI	18.63	5.00	MICROGRAFX INC.	5.25	-0.75	-12.5
	MSFT	87.50	41.00	MICROSOFT CORP. (H)	87.50	3,63	4.3
	ORCL	51.00	26.38	ORACLE CORP.	42.00	0.38	0.9
	PMTC	59.50	26,00	PARAMETRIC TECHNOLOGY (H)	57.38	1.63	2.9
	PARO	14.63	1.69	PARCPLACE SYSTEMS INC. (L)	1.75	-0.38	-17.6
	PSET	54.50	17.13	PEOPLESOFT (H)	53.25	3,00	6.0
	PTEC	20.38	12.50	PHOENIX TECHNOLOGIES	16.50		4.8
	PSQL	13.75	3.13	PLATINUM SOFTWARE (H)	13.44	0.31	2.4
	PLAT	18.75	9.25	PLATINUM TECHNOLOGY	15.63	0.63	4.2
	PRGS	29.50	12.13	PROGRESS SOFTWARE CORP.	20.00	0.94	4.9
	RNBO	24.25	14.63	RAINBOW TECHNOLOGIES INC.	19.13	0.75	-3.8

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			2 PM	CHANGE	CHANGE
61.00	17.13	RED BRICK SYSTEMS INC.	22.50	0.38	1.7
58.25	29.25	SAPIENT CORP.	41.75	-1.13	-26
9.13	5.50	SCO INC.	8.38	1.06	14.5
\$4.50	22.63	SECURITY DYNAMICS TECH.	34.38	-3.63	-9.5
	17.50		28.13	-3.88	-12.1
19.75	9.19	STATE OF THE ART	12.63	-1.13	-8.2
81.38	28.25	STERLING SOFTWARE INC.	31.00	-0.13	-0.4
	15.00	STRUCT, DYNAMICS RESEARCH	24.50	2.75	12.6
35.88	13.50	SYBASE INC.	18.50	0.88	5.0
18.13	8.75	SYMANTEC CORP.	16.94	-0.19	-1.1
50.50		SYNOPSYS	40.75	-1.88	4.4
26.75	8.25	SYSTEM SOFTWARE ASSOC.	11,38	-0.75	-6.2
36.50	5.13	SYSTEMSOFT CORP.	13.63	-0.38	-2.7
9.63	2.44	TRUEVISION CORP.	3,63	0.25	7.4
17.50	8.38	ViewLogic Systems	12,00	0.50	4.3
12.63	5.50	VMARK SOFTWARE INC.	6.63	-0.50	-7.0
15.63	7.00	WALKER INTERACTIVE SYSTEMS	13.50	-0.75	-5.3
27.50	12.25	WALL DATA INC.	16.00	-0.50	-3.0
26,13	15.38	WANG LABORATORIES INC.	21.75	0.38	1,8
	58.25 9.13 54.50 39.75 19.75 19.75 81.38 37.38 35.88 18.13 50.50 9.63 17.50 9.63 17.50 12.63 15.63 27.50	\$8.25 29.25 9.13 5.50 19.75 17.50 19.75 9.19 81.38 28.25 17.39 15.00 18.13 8.75 18.13 8.75 18.50 50 27.50 27.50 8.38 12.61 5.50 15.65 7.00 15.63 7.00	\$3.55 2925 SARRIST CORP. \$1.30 5.50 CO INC. \$4.50 22.51 SECURITY DYNAMICS TECH. \$5.50 22.51 SECURITY DYNAMICS TECH. \$5.50 22.51 SECURITY DYNAMICS TECH. \$1.31 SECURITY DYNAMICS TECH. \$1.34 12.52 STREAMS COFFWARE INC. \$7.34 15.00 SYMMET CORP. \$5.50 11.50 SYMMET CORP. \$6.50 5.11 SYMMET CORP. \$6.50 2.44 TRUVISION CORP. \$6.50 2.44 TRUVISION CORP. \$6.50 2.44 TRUVISION CORP. \$6.50 3.10 SYMMET CORP. \$6.50 3.10 SYMET CORP. \$6.50 3.10 SYMMET CORP. \$6.50 3.10 SYMMET CO	\$2.25 SARGER* CORP. 41.75	61.00 17.13 RED BRICE SYSTEMS INC. 22.50 0.38 58.35 28.25 SAMERIT GORP. 41.75 -1.13 58.35 28.25 SAMERIT GORP. 41.75 -1.13 58.30 22.33 SECOUNT OF TRANSIC STICK. 8.38 1.08 58.30 22.33 SECOUNT OF TRANSIC STICK. 12.38 -1.38 58.35 28.25 SECOUNT OF TRANSIC STICK. 12.38 -1.13 58.35 28.25 SECOUNT OF TRANSIC STICK. 13.00 -0.13 58.35 28.25 SECOUNT OF TRANSIC STICK. 13.00 -0.13 58.35 38.35 SECOUNT OF TRANSIC STICK. 13.00 -0.13 58.35 28.25 SECOUNT OF T

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AOL	71,00	22.38	AMERICA ON-LINE	41.88	3.38	8.8
BBN	35,13	15.63	BBN Comp.	25.88	0.75	3.0
CSRV	35,50	8.63	COMPUSERVE CORP.	10.63	-0.38	-3.4
EDFY	55,75	13.38	EDIFY CORP.	15.25	0.75	5.2
LCOS	29.25	5.75	Lycosine.	13.50	1.38	11.3
NETC	44.50	12.25	NETCOM ON-LINE	13.25	-0.50	-3.6
NSCP	86.00	34.50	NETSCAPE COMM. CORP.	43.00	-3.75	-8.0
OMKT	42.25	11.50	OPEN MARKET INC.	13.25	-1.75	-11.7
PSIX	19.38	6.75	PSINET	9.31	-3.81	-29.0
ODEK	22.13	3.94	QUARTERDECK CORP.	4.81	-0.0€	-1.3
RAPT	39.25	12.75	RAPTOR SYSTEMS	22.25	1.75	8.5
SCUR	46.25	6.00	SECURE COMPUTING CORP. (L)	8.50	0.88	11.5
SPYG	45.50	10.00	SPYGLASS INC.	12.63	0.38	3.1
YHOO	43.00	15.50	YAHOO! INC.	25.88	6.63	34.4
500			-	- 0	100	

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D	34.63	10.25	ADVANCED MICRO DEVICES (H)	34.38	7.00	25.6	
1	28.75	12.75	ANALOG DEVICES INC. (H)	27.63	0.63	2.3	
PS	26.50	8.00	CHIPS AND TECHNOLOGIES	15.25	-5.88	-27.8	
JS	27.25	12.63	Cimeus Logic	16.75	0.38	2.3	
	16.63	9.13	CYPRESS SEMICONDUCTOR CORP.	14.13	-0.50	-3.4	
XS	36.50	11.50	CYRIX	24.50	4.00	19.5	
C	149,75	49.81	INTEL CORP. (H)	144.56	1.56	1.1	
	39.63	17.00	LSI LOGIC CORP.	34.13	3.50	31.4	
C	51.13	19.75	LATTICE SEMICONDUCTOR (H)	50.00	5.63	12.7	
RL	38.63	12.00	MICREL SEMICONDUCTOR INC. (H)	36.75	0.25	0.7	
	69.38	16.63	MICRON TECHNOLOGY	31.00	-0.88	-2.7	
T	69.13	44.13	MOTOROLAINC.	69.13	2.13	3.2	
M	27.63	13.00	NATIONAL SEMICONDUCTOR	26.00	1.13	4.5	
ų.	69.25	40.50	TEXAS INSTRUMENTS	66.00	-1.75	-2.6	
1	29.25	10.38	VLSITECHNOLOGY	17.63	-6.13	-25.8	
X.	46.50	24.50	XILINX	43.13	4.50	11.7	
;	40.38	14.88	ZILOG INC.	26.63	2.13	8.7	

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PCC	31.50	7.88	AMERICAN POWER CONVERSION (H)	28.88	-0.56	-1.9
DPT	43.75	17.50	ADAPTEC INC. (H)	43.25	3.94	10.0
BEX	7,63	1.50	CAMBEX CORP.	1.75	-0.13	-6.7
REAF	11,88	3.50	CREATIVE TECHNOLOGY LTD.	11,25	0.50	4.7
ACE	24.50	3.75	DATA RACE INC.	19.63	3.63	-15.6
TM	10.63	4.13	DATARAM CORP. (H)	9.63	-0.25	-2.5
MC.	39.88	16.13	EMC CORP. (H)	37.75	2.63	7.5
MLX	21.38	6.38	EMULEX CORP.	17.13	1.00	6.2
SCC	29.00	19.50	EVANS AND SUTHERLAND	23.38	-1.63	-6.5
XBT	22.75	9.50	EXABITE (L)	10.56	-2.94	-21.8
SLF	4.13	1.38	INTELLIGENT INFO. SYSTEMS	2.50	0.63	33.3
MC	55.13	5.75	IOMEGA CORP.	16.3%	-0.63	-3.7
LS	8.25	1.25	IPL SYSTEMS INC.	1,69	0.13	8.0
MAG	37.00	17.63	KOMAG INC.	28.88	0.25	0.9
ITSI	29.75	11.25	MICRO TOUCH SYSTEMS INC.	28.13	2.88	11.4
EAK	31,25	10.13	PEAK TECHNOLOGY GROUP	11.63	0.75	6.9
NCL	16.25	2.00	PINNACLE MICRO INC.	5.00	-0.50	-9.1
QM	6.75	3.75	QMS INC.	5.63	0.00	0.0
MTM	34.00	10.88	QUANTUM CORP. (H)	31.38	-0.13	-0.4
DUS	4.88	0.44	RADIUS INC.	0.44	-0,06	-12,5
EG	49.63	18.13	SEAGATE TECHNOLOGY (H)	48.38	3.00	6.6
TK	52.00	22.63	STORAGE TECHNOLOGY	51.00	3.75	7.9
TLC	8.75	0.63	STREAMLOGIC CORP.	0.75	0.03	4.3
EK	52.25	29.75	TERTRONIX INC.	50.00	-1.13	-2.2
/DC	75.88	16.25	WESTERN DIGITAL CORP. (H)	69.88	4.50	6.9
RX	58.25	39.88	XEROX CORP.	57.50	1.63	29

54	West.				PP L	0496	
AMSY	37.13	18.50	AMERICAN MGMT, SYSTEMS	22.00	-1.88	-7.9	
ANLY	30.50	13.63	ANALYSTS INT'L	28.25	0.25	0.9	
AUD	45.75	35.63	AUTO DATA PROCESSING	44.50	1.63	3.8	
BDMI	61,50	26,00	BDM INTERNATIONALING.	56.00	1.00	1.8	
CATP	37.25	14.63	CAMBRIDGE TECH, PARTNERS	32.63	1.15	3.6	
CEN	54.88	36.75	CERIDIAN CORP.	38.50	-2.00	4.9	
CDO	33.00	19.88	COMDISCO INC.	31.38	0.38	1.2	
CHRZ	54.00	15.00	COMPUTER HORIZONS	35.00	-0.75	-2.1	
CSC	86.50	64,13	COMPUTER SCIENCES	77.25	-3.63	4.5	
TSK	47.50	16.75	COMPUTER TASK GROUP (H)	45.63	1.38	3.1	
CPU	30.88	6.50	COMPUSA INC.	17.63	2.63	17.5	
CDAT	28.63	12.75	CONTROL DATA SYSTEMS INC.	22.25	0.63	2.9	
EGGS	13,88	4.75	EGGHEAD DISCOUNT SOFTWARE	5.25	0.13	2.4	
EDS	63.38	40.75	ELECTRONIC DATA SYSTEMS CORP.	48.75	0.38	0.8	
INAC	40.63	13.38	INACOM CORP.	32.63	-3.75	-10.3	
INEL	11.50	3.50	INTELLIGENT ELECTRONICS	7.63	0.63	-7.6	
KEA	34.88	10.13	KEANE INC. (H)	32.38	-1.88	-5.5	
MICA	25.00	7.50	MICROAGE INC.	21.06	-1.69	-7.4	
PAYX	63.63	33.13	PAYCHEX	51.25	1.88	3.8	
PMS	55.50	33.13	POLICY MANAGEMENT SYS.	45.25	0.75	1.7	
REY	28.25	18.25	REYNOLDS AND REYNOLDS	26.00	1.13	4.5	
SCBI	30.50	14.44	SCB COMPUTER TECH. INC.	17.75	-0.50	-2.7	
SEIC	26.38	17.75	SEI CORP.	20.88	-1.00	4.6	
SMED	72.13	42.25	SHARED MEDICAL SYSTEMS	47.50	-2.25	4.5	
SSPE	32.25	17.00	SOFTWARE SPECTRUM INC.	30.75	1.50	5.1	
VST	29.75	9.00	VANSTAR CORP.	18.38	-4.00	-17.9	
SNDT	47.50	27.63	SUNGARD DATA SYSTEMS	38.75	0.50	-1.3	

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Retailers score big time

that make up the \$10 billion licensed sports industry business, it's the latter. They win whether it is Bill Parcells or Mike Holmgren who is carried off the field as the victorious coach after Super Bowl XXXI in New Orleans Sunday night.

Just as the New England Patriots and Green Bay Packers have worked to build Super Bowl teams, merchandisers Lids, Pro Player Corp. and others have toiled to build the infrastructure that allows them to compete at the top level.

SPEED IS EVERYTHING

"Fans are sucking championship hats out of our stores," said Peter Ross, MIS director at Lids, a Westwood, Mass,-based chain that has 106 stores in 23 states. including the Super Bowl team states of Massachusetts and Wisconsin. "In this business. you win by having hats available as soon after a game as is humanly possible."

That is accomplished by building information systems that are truly flexible in a market that defines just-in-time manufacturing. Most retailers cover their bets by placing orders for Super Bowl championship gear for both teams

But some retailers want only gear for the eventual Super Bowl champions. The same goes for the cottage industry of sports gear resellers that pops up after the championship games (see photo at right).

"Flexibility in this case is the key to supporting merchandisers' ability to bring products to the masses more quickly and less expensively," said Matthew Giannini, an analyst at G2 Research, Inc. in Mountain View. Calif. "Lots of merchandisers find it tough to plan until the last minute, which isn't really planning. That delays product delivery.

Charlie Gallo outlined Pro Player's game plan.

Retailers are notified in December by the Hudson, N.H., supplier to either call in orders or visit warehouses near the four championship teams. There, they can view a variety of color shirt designs on laptops.

The retailers also can call up Pro Player's World Wide Web site (www.proplayer.com) and view a subset of the designs. The company doesn't display all the designs for fear they will be copied by unlicensed



The sports apparel industry demands flexible information systems to get merchandise for win ning teams on display as soon as possible after a big game

Orders are entered on the laptops and travel over regular analog dial-up lines to Pro Player's IBM AS/400, which tabulates them and sends back an estimate of when shirts will be ready. The orders are then sent back to the printing presses at the warehouses.

"We predict that if the Patriots win the Super Bowl, retailers will have vans backed up here at midnight Sunday so they can have the shirts in their stores Monday morning," said Gallo, vice president of MIS, customer service and production/scheduling at Pro Player. "If Green Bay wins, that'll happen in Wiscon-

Lids' game plan relies on PCs with special point-of-sale software in each of its stores. The PCs are used to create and send orders over dial-up lines to an IBM RS/6000 at its headquarters, which runs an automated merchandising system from Richter Systems, Inc. in New York.

"It's a differentiator that we use PCs in stores instead of a proprietary cash register configuration because it lets us send urgent E-mail messages to the stores that couldn't be displayed on regular registers," Ross said.

Lids is considering running Microsoft Corp. and Lotus Development Corp. applications

CD-ROM Super Bowl simulations show Cheeseheads rule

▶ Three leading games back up the oddsmakers

By Rick Saia

NO MATTER WHICH way you look at Super Bowl XXXI, the experts seem pretty smart - at least when it comes to some leading computer games playing out the Packers/Patriots matchup.

After Green Bay and New England advanced to the big game in New Orleans, I took three CD-ROM games and played a Packers/Patriots simulation on

The overwhelming conclusions: The Pack is back

Green Bay quarterback Brett Favre knows how to throw touchdown passes.

New England quarterback Drew Bledsoe, meanwhile, has trouble moving the ball down the field.



NEW ORLEANS, LOUISIANA

SIMULATION 1

Front Page Sports Football Pro '97 Sierra On-line Inc., Bellevue,

www.sierra.com

Green Bay 14, New England 6

I clicked on Quick Start for a New England/Green Bay game in Green Bay (the Packers are technically the Super Bowl's "home" team). Luckily, the given weather conditions were sunny with a slight breeze.

As for the game (the computer called all plays), both defenses dominated.

Green Bay scored first in the second quarter after the Packers stopped Patriot running back Curtis Martin on fourth-andone from the New England 39.

Two plays later, the Packers scored on a Favre touchdown pass to take a 7-0 lead. New England closed it to 7-3 before halftime on an Adam Vinatieri field

In the fourth quarter, Vinatieri kicked another, making it a one-point game. But the Packers, on the ensuing drive, drove 72 yards in 11 plays, all on the ground, and ate up more than seven minutes. Edgar Bennett ran in from the Patriots' 6 for the second touchdown.

SIMULATION 2

Madden '97 Electronic Arts, San Mateo, Calif. www.easports.com

Green Bay 44, New England 13 With a PC calling the plays, the game moved quicker than a typical NFL contest. It took the players no more than three seconds in the huddle before

scurrying up to the line of scrimmage.

I stopped the midway game through the third quarter, after the Patriots had cut the Packer lead from 44-6 to

44-13 (for Patriots fans, shades of Super Bowl XX).

The Packers' offense dominated. Favre passed for more than 400 yards despite throwing three interceptions.

Bledsoe, meanwhile, threw four interceptions, one of which was returned for a touchdown.

SIMULATION 3

NFL Quarterback Club 97 Acclaim Entertainment, Inc. Glen Cove. N.Y. www.acclaimnation.com

Green Bay 22, New England o

Green Bay quarterback Brett Favre knows how to throw touchdown passes.

In this game, simulated in a domed stadium artificial turf, I played for the Pats and a colleague called Packers'

Needless say, nothing worked for New England here. The Packers sacked Bledsoe for a safety in the first quarter. The offense scored the rest of the points (two on Favre





passes) in the second quarter.







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COMMENTARY

How Apple can win

David Coursey

on't you just love a good story? I do, and I'm Apple should probably send some megaconvinced that's what Apple needs right now: a new story to usher in a new operating system to a cynical world.

I'm a big believer in stories as a way of explaining who and what we are. Companies are just like people in that regard. The proper story helped propel Apple to greatness, and now a new story is needed to explain the "new" Apple. Ideally, the story would attract Computerworld readers to Apple's next-generation operating system, code-named Rhapsody. At the very least, it must prevent them and their IS brethren from turning up their noses, effectively making Rhapsody uncool or even dead on arrival.

And because Apple will generate a story whether it wants to or not, I'd like to suggest the following one: Rhapsody should be "the operating

system for the intranet," specifically designed to host Web-based applications on Intel, RISC and PowerPC platforms, with the same binaries able to run on all three.

That's the short version - a positioning statement of sorts - but it needs support. Anybody can make such a state-

ment; how can Apple make it come true?

Well, it can't least not alone. To be the operating system for the intranet, Apple will need help from companies that already are the intranet. That means vendors such as Netscape, Oracle, Java-Soft and a few others need to think of Rhap-

sody the same way everyone at Microsoft thinks of Windows 95 and Windows NT: It's ours, and we bend it to do what we need done.

Popularizing Rhapsody won't be easy.

bucks to Netscape to help hire programmers to port SuiteSpot to Rhapsody. Oracle might need help getting its databases to run on the new operating system, as databases and tools are essential to intranet developers. And Rhapsody has to make Java look really good, especially for developing server applications.

Software from three companies doesn't a platform make, though it's gen-

erally agreed that desktop publishing — early versions of Adobe's PageMaker, specifically kept the Macintosh alive in its early days.

If Netscape and Apple put their minds to it, the Rhapsody version of SuiteSpot - coupled with Oracle - could be an excellent intranet and client/server appli-

cation platform. Both companies have big customer bases. And Next Software, Apple's new acquisition, has the building blocks for a great system.

At the same time, Rhapsody must be

easier to install and maintain, and it must have a cost-of-ownership advantage over Windows NT. Putting the Macintosh interface atop Rhapsody can achieve some of that, but packaging and pricing will contribute as well.

Who will buy Rhapsody? It depends, of course, on what Apple can accomplish and in what period of time. There are a reasonable number of people looking for an NT alternative that isn't Unix. And NT customers themselves will benefit from the innovation and lower pricing that competition brings.

If Apple can accomplish this - and it's a tall order — then Rhapsody gets a story that at least some corporate customers will listen to. Whether they'll buy it is another story. But without a good story, Apple loses all hope of a happy ending.

Coursey wrote this column while he was sick with the flu. If it doesn't make sense to you, please blame the cold medication and not Coursey. He is accepting get-well E-mail at david@coursey.com. When he recovers, David will return to editing his newsletters and being his usual charming self. But until

What's the cost of not learning?

Charles Babcock

earning may be something you thought you left •Is there a constant dialogue going on behind once you escaped from calculus class. But not so fast. We are now all functioning in a world where learning is a continuous process — not just a classroom experience.

Technology and the Internet are creating a modern-day gold rush of opportunity. Those who learn quickly gain immense advantages over those who don't. And learning quickly may have as much to do with your habits in using technology as with your IQ. In narrowly decided races, the aid to learning provided by the desktop PC can be a deciding factor. If your technology habits reinforce your learning habits, a whole new element enters into the valuation of the cost of ownership of desktop technology.

And a new challenge arises inside the organization. How does it maximize technology tools for learning? When are they an aid vs. a distraction? We need to understand how our organization learns collectively and whether it learns any faster when more workers are equipped with PCs. My intuitive sense is that active PC users, with their electronic mail, Web

browsers and collaborative groupware, are learning faster than those who aren't similarly equipped. But I haven't seen

any figures from the think tanks on that.

Learning in organizations doesn't occur haphazardly, according to an article in the Winter 1995 edition of MIT's Sloan Management Review. Some organizations encourage it by the way they are structured; others miss the boat. The article cites these points:

It matters whether knowledge in an organization is viewed as a possession of individuals or something to be shared and made public. Does top management exemplify information sharing or information hoarding?

within the organization over the quality of its product and the nature of its customers, or is that left to specialized fiefdoms that brook no challenge?

I look at my co-workers and realize that one of them learns very quickly about the external world by going on a daily jaunt on the Web. Much of his picture of the world depends on what he sees there, and that picture is very much up-to-date.

I like reading everything on a topic in a

single day, so I'm more likely to visit Computerworld's brary of publications or turn to the indexed online services that give me a long reference list. The Web is part of this, but my method is more like hanging out in the stacks than going Web-waltzing.

Another co-worker gravitates to the online chat sessions where technical selfhelp sessions are under way. And she fre-

I see no particular merit to my way of learning over the others, and I don't hesitate to pick the brains of others, knowing their strengths. I do see our desktop computers extending our strengths and allowing us to make use of them in different ways. We take it for granted that we can find out what we want to know because the computer has done such an impressive job of extending our reach.

Attitudes within your organization toward experimentation and risk-taking are also important. If someone tries a new way of doing things and it fails, is he congratulated or excoriated? Is doing things a new way viewed as a learning vehicle in itself? It should be.

Too often, learning is seen as a formal process; one party imparts learning to another. "The mere presence of traditional training isn't sufficient: it must be accomplished by a palpable sense that one is never finished learning," according to the Sloan Review

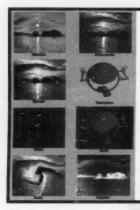
In this new information nation, it isn't the PC itself that is key, but it has been key to giving us the sense that we can learn what we need to know. Cultivating that belief is today's difference between success and failure.

Babcock is Computerworld's technical editor. His Internet address is charles_babcock @cw.com.



The Back Page

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CHANGING YOUR IMAGE

Don't have an in-house graphics wizard? Send your images to the Imaging Machine (www.vrl.com), which will transform them using a variety of graphics-editing techniques and filters that you select. The tricks include defining edges, embossing, flopping, blurring, high-contrasting, making negatives and combining images. The Web-based service is free from Visioneering Research Laboratory in Las Cruces, N.M.

Tired talk

ordsmiths at Lake Superior State University in Sault Ste. Marie, Mich., are, like, getting irritated. The school has released its 21st annual list of words and phrases that should be banished because they're misused, overused or useless - and the news isn't good for the high-tech community. "Multitasking" should be banned, said a teacher in Perry, Mich., who claimed that "doing several things at once" is sufficient. "Downtime" is fine for computers, but not humans. ruled one English professor. Meanwhile, "outsourcing" and its cousin "downsizing" were ridiculed.

Virus scum

Sci-fi writer and digerati member Bruce Sterling acknowledges he's a hacker-sympathizer. But he draws the line at virus writers, whom he calls "antisocial moron kids" in an article for IBM's antivirus webzine (www.av. ibm.com). "The thing that truly disgusts me about virus writers is their weirdly gratuitous meanness," he writes. "They poison the digital wells and the flowing rivers."

Digital archives



TEN YEARS AGO

- Apple unveils the overdue AppleShare file server, a sign that it's serious about the corporate market.
- The Intel 80386 chip is described as "lightning fast."
- Headline: "Windows to play role as 386 tool."
- Ross Perot invests \$20 million in Steve Jobs' start-up, Next Software.
- Alabama bans PCs from its legislative chamber because of the annoving "tap, tap,
- Headline: "Stumbling in DP, Wang will post loss; cuts salaries, jobs."
- Enrollment in college computer science programs is dropping because students are disillusioned by the computer industry slump and the demanding nature of the field.

nd your alt.cw contributions to tts@cw.com. If your item is used I'll receive a cool T-shirt

Inside Lines

Welcome to the Web

Internet newbies who visit the Internet Society's Web site at www. isoc.org can click on a button labeled, "What is the Internet?" Last week, that led to a long delay followed by the message: "There was no response. The server could be down or not responding." Yup, that's

HP slashes Unix workstation prices

Call it the Wintel effect, or maybe it's a reaction to similar price cuts by other RISC vendors. But Hewlett-Packard today will roll back prices across its Unix technical workstation lineup by up to 40%. For example, the price of an entry-level B-class workstation will be reduced by 37%, from \$12,700 to \$8,000. Similarly, the price of a midlevel Cclass workstation has been knocked back 36%, from \$33,000 to

Time flies when you're cracking code

PCCrypto, a desktop encryption product from McAfee Network Security and Management in Santa Clara, Calif., was promoted in a recent news release as follows: "PCCrypto's encryption is so powerful, McAfee estimates it would take 1 trillion supercomputers, which could each test a trillion keys per second, about 463 trillion centuries to break a PCCrypto code."

Well, it's a good thing they said "about." A trillion centuries here and a trillion centuries there, and sooner or later you're talking real

Walk this way, surf this way

Perhaps this is a reflection of just how hip the 'net is. Keith Garde, a 20-year entertainment industry veteran who was most recently comanager for the band Aerosmith, has been appointed executive vice president in charge of strategic marketing and new business development at Patxi Entertainment Network. The Guilford, Conn.-based celebrity Internet service's holdings include Supermodel.com and Superstars.com.

Apples and cookies

The beta version of Apple's Cyberdog 2.0 Web browser, available at cyberdog.apple.com, adds support for cookies — the files that Web sites can use to store data on your hard disk drive — and includes commands to block or erase cookies. The erase command's name? Toss Cookies

IBM to launch 'lite' laptops

Word has it that IBM will shortly release a no-frills notebook aimed at road warriors who aren't interested in the power and fancy multimedia of recent releases. Sources say IBM will position the new low-end notebooks for those users who are simply interested in getting and receiving data and in being connected to the office vs. having the capability to give high-powered sales presentations.

Reusable templates

Some technology pros dabbie in journalism, but one IS manager is taking it a step further. John Williams, who was most recently director of IT architecture and standards in the IT services department at Carolina Power and Light, is joining Object Magazine in New York as its new editor. Having already written a variety of feature stories in the past, Williams is also the author of What Every Software Manager Must Know To Succeed With Object Technology.

t's only January, and we already have our nominee for the dumbest book of 1997. It's The Original Internet Address Book, published by Prentice-Hall. For \$5.95, you get a little blue book to write down all your favorite Internet addresses. We think it's just the thing to own if you have a version of Netscape that doesn't have bookmarks, or want to log onto your favorite Web sites when your computer crashes. If you've seen any dumb books lately, or have anything else to share, get in touch with news editor Patricia Keefe at patricia_ keefe@cw.com or call (508) 820-8183.

Citizen Jobs

Gene Gable, publisher of Publish magazine, says the parallels between auteurs Steve Jobs and Orson Welles are many.

Apple Macintosh

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